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NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS
ROCKY LAKE DAMS (ME 0. (U) CORPS OF ENGINEERS WALTHAM
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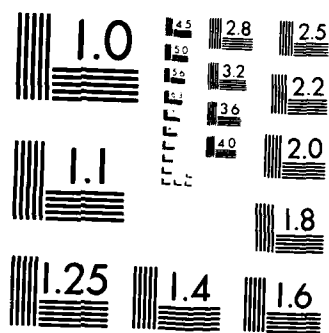
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AD-A156 367

ORANGE RIVER BASIN
WHITING, MAINE

ROCKY LAKE DAMS
ME - OO399

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



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JUL 05 1985
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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

MARCH 1979

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| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number) DAMS, INSPECTION, DAM SAFETY, Orange River Basin Whiting Maine Rocky Lake | | |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The dams consist of two stone filled timber crib structures located about 400 ft. apart. The dams are assessed to be in poor condition. Because the south-erly dam has been breached, it poses no threat to life or property downstream. It is intermediate in size with a hazard potential of low. | | |



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED

MAY 29 1979

Honorable Joseph E. Brennan
Governor of the State of Maine
State Capitol
Augusta, Maine 04330

Dear Governor Brennan:

I am forwarding to you a copy of the Rocky Lake Dams Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Agriculture and the Department of Transportation, cooperating agencies for the State of Maine. In addition, a copy of the report has also been furnished the owner, M.J. Garber and Herman Galvin, c/o Mr. Warren Strout, MacDonald Page Co., 562 Congress Street, Portland, Maine 04112.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you, the Department of Agriculture and the Department of Transportation for your cooperation in carrying out this program.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

ORANGE RIVER BASIN

WHITING, MAINE

ROCKY LAKE DAMS

ME-00399

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

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| Approved for Release | |
| by Special Agent | |
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NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

ME-00399

ROCKY LAKE DAMS

WASHINGTON COUNTY, MAINE

ROCKY LAKE

November 28, 1978

BRIEF ASSESSMENT

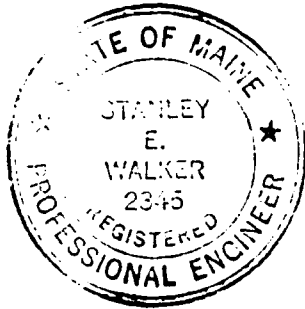
The Rocky Lake Dams consists of two stone-filled timber crib structures located about 400 feet apart, separated by an island. The northerly dam is in seriously dilapidated condition and the southerly dam has been breached and retains no water. The northerly dam is about 14 feet high, and is about 150 feet long.

Based on the visual inspection, the Rocky Lake Dams are assessed to be in poor condition. Because the southerly dam has been breached, it poses no threat to life or property downstream. Although the northerly dam is in poor condition, the structure appears to present little threat to the safety of downstream residents or property. Based on the Corps of Engineers guidelines, the dams are classified as intermediate size dams having a low hazard potential.


The spillway test flood is one-half the probable maximum flood (PMF). The test flood outflow is about 1450 cfs. The spillway capacity of the northerly dam plus capacity of the culvert under the road, located about 100 feet downstream of the breached southerly dam, is about 59 percent of the routed test flood.

Due to the dilapidated condition of both dams, it appears that an attempt to repair the structures would be impractical. Complete reconstruction would be required to upgrade the condition of the structures. Within 12 months of receipt of this report, the Owner should engage a qualified engineer to advise him whether to remove or reconstruct the

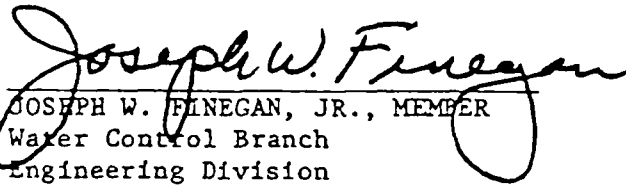
dams. Reconstruction or removal should be done under the supervision of a qualified engineer. If the dams are to be reconstructed, a program of annual periodic technical inspection should be instituted.

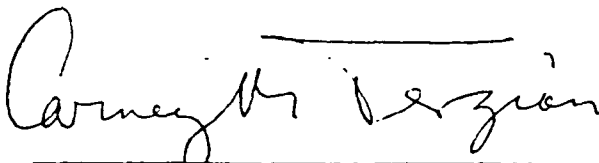


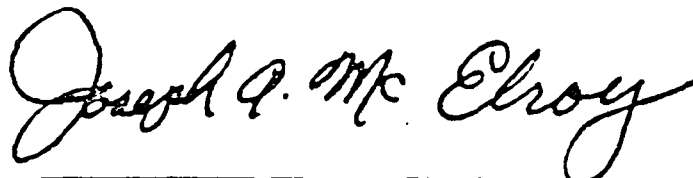
EDWARD C. JORDAN CO., INC.


Stanley E. Walker, P.E.
Project Officer

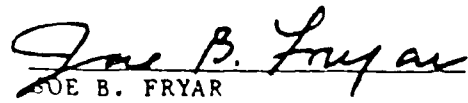
This Phase I Inspection Report on Rocky Lake Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.


JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division


CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division


JOSEPH A. MCELROY, CHAIRMAN
Chief, NED Materials Testing Lab.
Foundations & Materials Branch
Engineering Division

APPROVAL RECOMMENDED:


SUE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonable possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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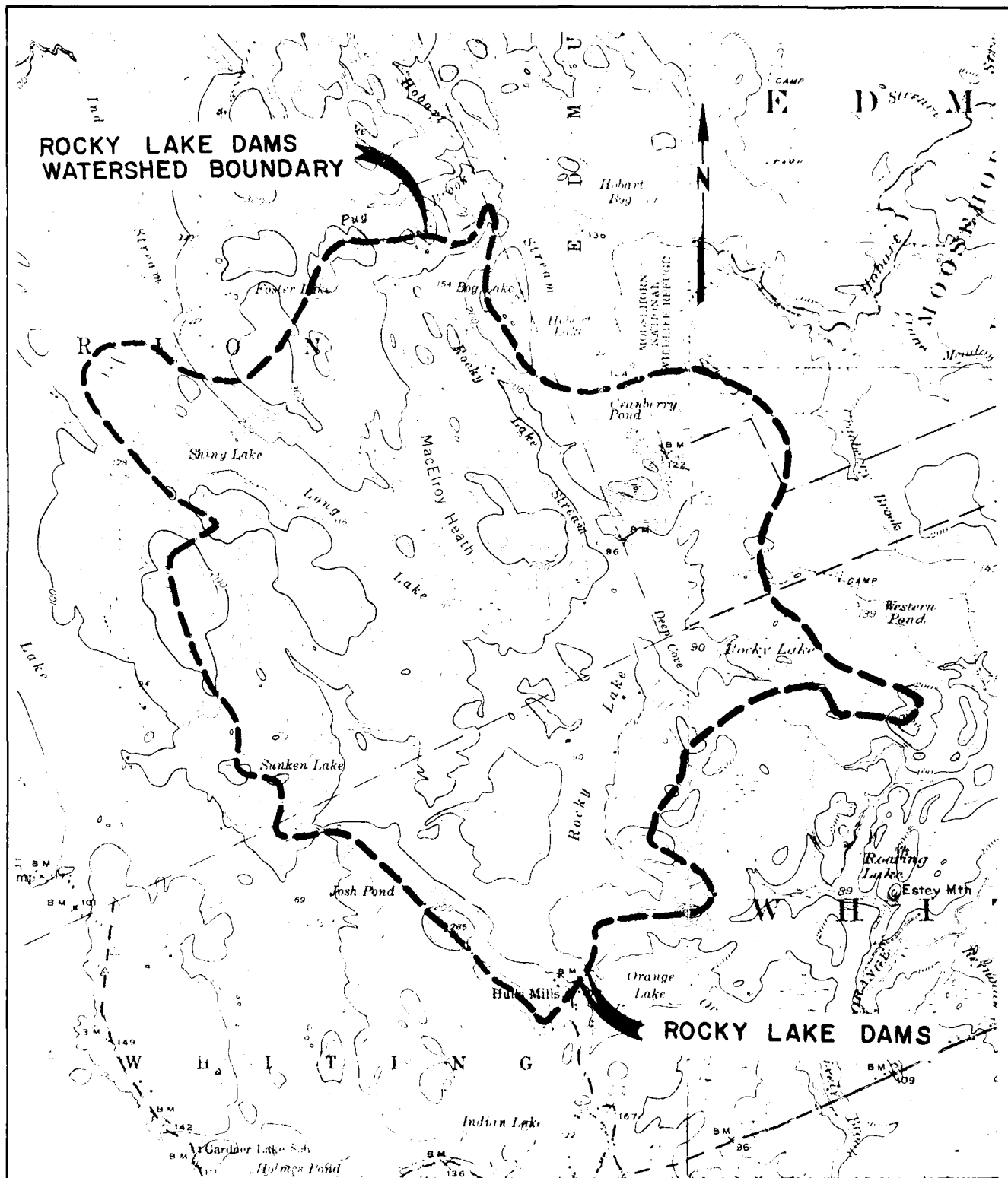
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OVERVIEW



U.S. GEOLOGICAL SURVEY MAP
GARDNER LAKE, ME. QUADRANGLE
EASTPORT, ME. QUADRANGLE

0 1 2 3 MILES

| | |
|--|---|
| CHARLES J. JORDAN, JR. PORTLAND, MAINE | ARMED AND DANGEROUS DO NOT ENTER NO TRESPASSING |
| NATIONAL PROGRAM OF INSPECTION OF NON FEE DAMS | |
| ROCKY LAKE DAMS | |
| LOCATION & DRAINAGE AREA MAP | |
| ROCKY LAKE | ME. |
| 2079915 | DATE AS SHOWN MARCH 1979 |

PHASE I INSPECTION REPORT

ROCKY LAKE DAMS

SECTION 1

PROJECT INFORMATION

1.1 GENERAL

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Edward C. Jordan Co., Inc. has been retained by the New England Division to inspect and report on selected dams in the states of Maine and New Hampshire. Authorization and notice to proceed were issued to Edward C. Jordan Co., Inc. under a letter of December 1, 1978 from Max B. Scheider, Colonel, Corps of Engineers. Contract No. DACW33-79-C-0017 has been assigned by the Corps of Engineers for this work.

b. Purpose

- (1) To perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.
- (2) To encourage and prepare the states to initiate quickly effective dam safety programs for non-Federal dams.
- (3) To update, verify and complete the National Inventory of Dams.

1.2 DESCRIPTION OF PROJECT

a. Location. The Rocky Lake Dams are located at the outlet of Rocky Lake in the town of Whiting, Maine. N 44°-46.1', W 67°-16.0'.

- b. Description of Dam and Appurtenances. The Rocky Lake Dams consist of two stone-filled timber crib structures located about 400 feet apart and separated by an island. The northerly dam is in seriously deteriorated condition and the southerly dam has been breached and retains no water. The northerly dam is about 14 feet high and is about 150 feet long.

Plan and profile and cross-sections are presented in Appendix B.

- c. Size Classification. The Rocky Lake Dams have a storage capacity of about 9000 acre-feet and a height of 14 feet. According to Corp of Engineer's "Recommended Guidelines for Safety Inspection of Dams," a dam with storage capacity greater than 1,000 acre-feet but less than 50,000 acre-feet or a height greater than 40 feet but less than 100 feet is classified as an intermediate size dam.

- d. Hazard Classification. The Rocky Lake Dams are classified as having a low hazard potential. The peak flow from the hypothetical failure of the dams was estimated to be about 6900 cfs based on guideline procedures provided by the Corps of Engineers. Failure of the dams would result in water surface elevations about 6.5 feet higher than normal at the outlet of Orange Lake and about 7 feet higher than normal at the first downstream bridge, about 2.2 miles below the dam. Downstream of this bridge the water surface elevation would essentially be retained within swampy areas located in the flood plain.

e. Ownership.

Current Co-Owners: M.J. Garber & Herman Galvin
Contact: M.J. Garber
c/o Warren Strout
MacDonald Page Co.
562 Congress Street
Portland, Maine 04112
Tel. 207-774-5701

Previous Owner: Unknown

f. Operator.

None. (See e. above for contact person.)

g. Purpose of Dam. This dam is presently used to control the water level at Rocky Lake Dam for recreational purposes.

h. Design and Construction History. There is no available design and construction data pertinent to the dams.

i. Normal Operating Procedure. No operating and maintenance program is followed.

1.3 PERTINENT DATA

a. Drainage Areas. The drainage area consists of approximately 16.8 square miles of gently sloping forested terrain. Rocky Lake has an area of 1.8 square miles (1150 acres), which represents about 11 percent of the drainage area.

b. Discharge at Damsite. No record of high water could be located. The impounding system consists of a northerly and a southerly dam separated by an island. The southerly dam has been breached and hydraulic control for flood waters is at the road culvert, about 100 feet downstream of the dam.

(1) Outlet Works - The outlet works at the northerly dam are inoperable. At the southerly dam (roadway hydraulic control), there is a culvert that measures 8.8 feet wide by 11.8 feet high with an invert elevation of 79 MSL, about 7.5 feet below the lake outlet. The capacity of the culvert flowing full is about 460 cfs.

(2) The maximum flood at the damsite is unknown.

(3) Ungated spillway capacity with the pond at the top of the northerly dam is 400 cfs. There is no spillway at the southerly dam.

(4) Gated spillway capacity is not applicable.

- (5) Total project discharge at test flood (1/2 PMF) elevation of 93 is 1450 cfs.

c. Elevation. The survey datum was adjusted to mean sea level (MSL) datum based on the assumption that spillway crest of the northerly dam is equal to normal water surface elevation of 90 (MSL), as shown on the Gardner Lake, Maine U.S. Geologic Survey quadrangle. Due to the breaching of the southerly dam, present normal water surface is assumed to be elevation 88 (MSL).

The following elevations above mean sea level are approximate only.

| <u>Item</u> | <u>Elevation (Feet Above MSL)</u> |
|---|-----------------------------------|
| Top of northerly dam | 92.0 |
| Top of roadway downstream of southerly dam | 93.7 |
| Test flood (1/2 PMF) pool | 93.0 |
| North dam spillway crest | 90.0 |
| Full flood control pool | N/A |
| Recreation pool | 88 |
| Invert culvert located down- stream of southerly dam | 78.9 |
| Streambed at centerline of northerly dam | 78 |
| Maximum tailwater | Unknown |

d. Reservoir.

| <u>Item</u> | <u>Length (Miles)</u> |
|--------------------|-----------------------|
| Maximum pool | 3.8 |
| Recreation pool | 3.5 |
| Flood control pool | N/A |

e. Storage.

| Item | Storage (Acre-Feet) |
|---|---------------------|
| Recreation pool (elev. 88) | 4200 |
| Northerly dam spillway crest (elev. 90) | 6510 |
| Top of dam (elev. 92) | 9320 |
| Test flood (1/2 PMF) (elev. 93.0) | 10430 |

f. Reservoir Surface.

| Item | Surface Area (Acres) |
|---------------------------|----------------------|
| Recreation pool | 1100 |
| Flood control pool | N/A |
| Spillway crest pool | 1150 |
| Test flood (1/2 PMF) pool | 1465 |
| Top of dam | 1360 |

g. Dam.

Type - the dams are stone-filled timber crib structures abutted by earth embankments.

Length - The southerly dam has been breached; it was about 160 ft long. The length of the northerly dam is about 150 feet.

Height - The northerly dam is about 14 feet high.

Top Width - See plan and profile and cross-sections in Appendix B.

Side Slopes - See sketches in Appendix B.

Zoning - None.

Impervious Core - None.

Cutoff - Timber planking and mud seal.

Grout Curtain - None.

h. Diversion and Regulating Tunnel. Not applicable.

i. Spillway.

Type - The northerly dam has two self-loading timber deck spillways. See sketches in Appendix B.

Length - 39 \pm and 14 \pm feet.

Crest Elevation (Northerly Dam) - 90 (MSL).

Gates - None.

Downstream Channel - The channels below the northerly and southerly dams are narrow with a slope of about 0.7 percent. See Photographs 5 and 7. Both streambeds are composed primarily of gravel and cobbles. Located about 100 feet downstream of the southerly dam is an 8.8-foot wide by 11.8-foot high culvert beneath a road. This culvert appears to restrict the channel and is likely the hydraulic control during flood flow. The north channel is littered with debris, including two fallen trees. The two channels join as they enter Orange Lake about 1500 feet downstream of the dams.

j. Regulating Outlets.

Invert - Southerly dam - none
Northerly dam - 83 (MSL)

Size - Southerly dam - none
Northerly dam - two bays 5 ft wide by 9 ft high

Description - Control of the northerly dam outlet was by stop logs located between timber supports. Due to the deteriorated condition of the timber in the dam and the damming performed by beavers, the stop log outlet is not operable.

Control Mechanism - None

SECTION 2

ENGINEERING DATA

2.1 DESIGN

No design data were available for the Rocky Lake Dams.

2.2 CONSTRUCTION

No engineering data were available regarding construction of the dams.

2.3 OPERATION

No engineering operational data were available.

2.4 EVALUATION

- a. Availability. There are no engineering data or plans available that would be useful in evaluating the integrity of the Rocky Lake Dams.
- b. Adequacy. The lack of engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, performance history and engineering judgment.
- c. Validity. Not applicable.

SECTION 3
VISUAL INSPECTION

3.1 FINDINGS

- a. General. The Rocky Lake Dams consists of two structures which close the outlets from Rocky Lake. The structures are about 400 feet apart, separated by an island. The southerly dam has been breached and the northerly dam is in a dilapidated condition.
- b. Dams. The northerly dam is a stone-filled, timber cribwork structure. It is about 150 feet long and about 14 feet high. It is badly dilapidated as can be seen in Photograph 6. The timber members are rotted, split and broken, and many have become dislodged. The dam was retaining about 10 feet of water on November 28, 1978. Leakage through the structure was estimated to be 200 gpm. The stop log outlet works at the dam are dilapidated and inoperable and one outlet is presently closed by beaver workings.

The southerly dam was also a timber cribwork structure. It has been breached and presently retains no water. The timber structure is extremely dilapidated as shown in Photograph 5.

About 150 feet upstream of the remnants of the south dam, there is an earth embankment dike which appears to have been constructed since the breaching of the timber dam. This dike is about 200 feet long, 6 feet high and appears to close the old stream channel, as shown on the general site plan in Appendix B-1. The existing channel is just north of the northerly end of the dike. This channel has a bed consisting of bedrock overlain by cobbles and boulders. The channel is somewhat restricted by boulders and cobbles placed in the channel apparently to maintain low water hydraulic control. The earth dike appears to be in good condition. Some seepage is occurring at the downstream toe.

- c. Appurtenant Structures. Not applicable.

- d. Reservoir Area. The reservoir consists of Rocky Lake which is about 1150 acres and has a forested shoreline as shown in Photograph 3. There are a few cottages on the shore of the lake. The potential for slope failure above the dam appears minimal.
- e. Downstream Channel. The channels below the northerly and southerly dams are narrow with a slope of about 0.7 percent. See Photographs 5 and 7. Both streambeds are composed primarily of gravel and cobbles. Located about 100 feet downstream of the southerly dam is an 8.8-foot wide by 11.8-foot high culvert beneath a road. This culvert appears to restrict the channel and is likely the hydraulic control during flood flow. The north channel is littered with debris, including two fallen trees. The two channels join as they enter Orange Lake about 1500 feet downstream of the dams.

3.2 EVALUATION

Based on the visual inspection, the Rocky Lake Dams appears to be in poor condition. The northerly timber dam is badly dilapidated but presently intact and is retaining about 10 feet of water. The southerly timber dam has been breached. At the southerly dam low flow control is provided by a dike and restricted channel located about 150 feet upstream, and flood flows are controlled by the culvert beneath the road located about 100 feet downstream of the dam. Although in poor condition, the structure appears to present little threat to the safety of downstream residents or property. Further deterioration and eventual breaching will likely occur at the northerly dam. However, due to its timber cribwork construction, the breaching will likely occur in stages as opposed to a rapid failure of the entire structure.

SECTION 4
OPERATING PROCEDURES

4.1 PROCEDURES

There are no operating procedures.

4.2 MAINTENANCE OF DAM

There is apparently no maintenance program for the dams.

4.3 MAINTENANCE OF OPERATING FACILITIES

There is apparently no maintenance program for operating facilities.

4.4 DESCRIPTION OF ANY WARNING SYSTEM IN EFFECT

No warning system is known to be in effect.

4.5 EVALUATION

The Rocky Lake Dam operating equipment is in poor condition and is inoperable. No formal warning system for either high water or structural distress is in effect at the dams.

SECTION 5

HYDRAULIC/HYDROLOGIC

5.1 EVALUATION OF FEATURES

- a. General. Both the north and south dams are stone-filled timber crib structures. The south dam has been breached and the roadway just downstream serves as the flood water hydraulic control at the southerly damsite. The two dams are about 400 feet apart and are separated by an island.
- b. Design Data. Design data were not available.
- c. Experience Data. No information regarding specific overtopping events or other notable hydrologic occurrences was disclosed. However, it is reported by a local resident that the southerly dam breached about 10 years ago. The timbers on the northerly dam are rotted, split and broken, and many have become dislodged. However, the dam is still intact.
- d. Visual Observations. The outlet of Rocky Lake is controlled by two dams. The northerly dam outlet section is inoperable, and flow is controlled by two spillway sections. On November 28, 1978, the water surface of Rocky Lake was about 2 feet below spillway crest. About 150 feet upstream of the remnants of the breached southerly dam, there is an earth dike which reportedly has been constructed since the breaching of the timber dam. This dike is about 200 feet long, 6 feet high and appears to close the old stream channel. The existing channel is just north of the northerly end of the dike. This channel has a bed consisting of bedrock overlain by cobbles and boulders. The channel is somewhat restricted by boulders and cobbles placed about 2 feet high in the channel, apparently to maintain low water hydraulic control.

Below the breached southerly dam is a roadway culvert that provides flood water hydraulic control.
- e. Test Flood Analysis. The Rocky Lake Dams are classified as having a low hazard potential. Based on Corps of Engineers "Recommended Guidelines for

Safety Inspection of Dams" the spillway test flood is 1/2 of the probable maximum flood (PMF). The test flood was calculated to be about 5500 cfs, based on the COE's "Preliminary Guidance for Estimating Probable Maximum Discharges in Phase I Dam Safety Investigations." Consideration of the effect of surcharge storage reduces the test flood to 1450 cfs. The spillway capacity of the north dam plus the culvert capacity at the south damsite is about 860 cfs, which is about 59 percent of the routed 1/2 PMF. During the test flood event, the north dam would be overtopped by about 1 foot.

- f. Dam Failure Analysis. The hazard potential was determined by analyzing downstream dam failure hydrographs based on rule of thumb methods presented in an attachment to ETL 1100-2-234. The failure analysis assumes a breaching of the northerly dam with water surface at the top of the dam.

The peak flood flow including a breaching of the north dam, and flow through the culvert at the south damsite would be about 5700 cfs. Rocky Lake would empty in about 38 hours. The wave height at the north dam would be about 10 feet. At the outlet from Orange Lake, about 1.3 miles downstream, the flood peak would be attenuated to about 4200 cfs, and the normal elevation of the lake would rise about 6.5 feet. At the first downstream bridge, 2.2 miles below the dams, the flood peak would be reduced to about 3400 cfs and the flood depth would be about 7 feet. Downstream of the bridge the flood wave would essentially be maintained within swampy areas adjacent to the Orange River.

It appears that no downstream residences would be affected by failure of the dam. Potential damage appears to be limited to the cemetery on the north bank of the north discharge channel, and the bridge located about 2.2 miles downstream of the dams.

Since the timber crib structure of the north dam is badly dilapidated, resistance to overtopping is considered to be poor. Based on test flood calculations, the roadway at the south dam site would not be overtopped by the 1/2 PMF.

SECTION 6

STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

- a. Visual Observations. Based on the visual inspections, the Rocky Lake Dams appear to be in poor condition. The northerly timber dam is badly dilapidated but presently intact. However, flood flows overtopping the spillway sections would likely cause progressive breaching of the dam. Due to its timber cribwork construction, breaching will likely occur in stages. The southerly timber dam has been breached. The flow control at the south damsite is provided by a dike and restricted channel upstream and the road and culvert downstream.
- b. Design and Construction Data. None available.
- c. Operating Records. None available.
- d. Post Construction Changes. Since original construction, both the north and south dams have undergone progressive deterioration and the south dam has been breached. Subsequent to the breaching of the south dam, an earth dike had been constructed upstream of the timber dam to restrict the channel and maintain pond level.
- e. Seismic Stability. The dam is located in Seismic Zone No. 1 and in accordance with recommended Phase I Guidelines, does not warrant seismic analysis.

SECTION 7

ASSESSMENT, RECOMMENDATIONS, AND REMEDIAL MEASURES

7.1 DAM ASSESSMENT

- a. Condition. Based on the visual inspection and performance history of the Rocky Lake Dams, they are assessed to be in poor condition. The southerly dam has been breached. Low flow control is provided presently by an earth dike which restricts the upstream channel and, high flow control is provided by a roadway culvert in the downstream channel. The northerly dam is intact and retains about 10 feet of water. This timber structure is seriously dilapidated and flows overtopping the spillway section will likely cause progressive breaching. Due to the lack of significant downstream hazard, however, the condition presents little threat to the safety of downstream residents or property.
- b. Adequacy of Information. The information available is such that the assessment of the condition of the dam must be based primarily on the visual inspection, the past operational performance of the dam, and engineering judgment.
- c. Urgency. The recommendations and remedial measures outlined in 7.2 and 7.3 below should be implemented within 12 months after receipt of this report by the owner.
- d. Need for Additional Investigation. Additional investigation is not considered necessary for the current assessment.

7.2 RECOMMENDATIONS

A qualified engineer should be engaged to advise the Owner whether to remove or reconstruct the dams. Reconstruction or removal should be done under the supervision of a qualified engineer with consideration given to potential release of accumulated sediments or other possible environmental impacts of lowering the level of Rocky Lake. Any structure built to maintain the lake in back of the breached dam, such as the present dike, should be appropriately designed by a qualified engineer.

7.3 REMEDIAL MEASURES

- a. Operation and Maintenance Procedures. Due to their dilapidated condition, it appears that an attempt to repair the structures from their present condition would be impractical. Complete reconstruction would be required to upgrade the condition of the structures. If the dams are to be reconstructed, a program of annual periodic technical inspection should be instituted.

The remains of the south dam should be removed from the channel. Further break-up of this breached dam could clog the downstream culvert causing flooding.

7.4 ALTERNATIVES

The alternatives available appear to be removal of the structures or replacement (reconstruction) of the structures.

APPENDIX A

VISUAL INSPECTION CHECK LIST
AND
SUPPLEMENTARY INSPECTION NOTES

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT Rocky Lake Dams

DATE 11/28/78

TIME P.M.

WEATHER Snow, rain, cold

W.S. ELEV. _____ U.S. _____ DN.S. _____

PARTY:

- | | |
|---------------------------|-----------|
| 1. <u>Stephen Cole</u> | 6. _____ |
| 2. <u>Brian Bisson</u> | 7. _____ |
| 3. <u>Scott Decker</u> | 8. _____ |
| 4. <u>John Kimble</u> | 9. _____ |
| 5. <u>Charles Goodwin</u> | 10. _____ |

| PROJECT FEATURE | INSPECTED BY | REMARKS |
|---|---------------------------|---------|
| 1. <u>Geotechnical</u> | <u>Cole</u> | |
| 2. <u>Structural</u> | <u>Cole, Decker</u> | |
| 3. <u>Hydraulics/Hydrology</u> | <u>Bisson</u> | |
| 4. <u>Civil</u> | <u>Decker</u> | |
| 5. <u>Photography</u> | <u>Decker, Bisson</u> | |
| 6. <u>Survey</u> | <u>Kimble, Goodwin</u> | |
| 7. _____ | | |
| <u>Review Inspection</u> | <u>Stanley Walker and</u> | |
| <u>Dec. 14, 1978</u> | <u>Charles Horstmann</u> | |
| <u>No significant differences observed from 11/28/78 inspection</u> | | |

NOTE: See Supplementary Inspection Notes Following Checklist

INSPECTION CHECKLIST

PROJECT Rocky Lake Dams DATE 11/28/78
 PROJECT FEATURE Embankment NAME Cole
 DISCIPLINE Geotechnical NAME _____

| AREA EVALUATED | CONDITIONS | |
|--|--|-----------------------------------|
| <u>DAM EMBANKMENT</u> | South dam dike* at pond, above old dam | North dam - no dike embankment |
| Crest Elevation | 92+ (MSL) | |
| Current Pool Elevation | 88 (MSL) | NOT APPLICABLE |
| Maximum Impoundment to Date | Unknown | |
| Surface Cracks | None | |
| Pavement Condition | Turf | |
| Movement or Settlement of Crest | None | |
| Lateral Movement | None | |
| Vertical Alignment | Okay | |
| Horizontal Alignment | Okay | |
| Condition at Abutment and at Concrete Structures | N/A | |
| Indications of Movement of Structural Items on Slopes | None | |
| Trespassing on Slopes | None | |
| Sloughing or Erosion of Slopes or Abutments | None | |
| Vegetation | Turf | |

*Dike does not close the stream, about 40 feet of open channel exists north of the dike. This section controls at low flow.

| AREA EVALUATED | | CONDITIONS |
|--|--------------------------------------|----------------|
| <u>DAM EMBANKMENT</u> (cont.) | South Dam | North Dam |
| Rock Slope Protection - Riprap Failures | None | NOT APPLICABLE |
| Unusual Embankment or Downstream Seepage | Minor seepage near midpoint of dike. | |
| Piping or Boils | None | |
| Foundation Drainage Features | None | |
| Toe Drains | None | |
| Instrumentation System | None | |

INSPECTION CHECKLIST

PROJECT Rocky Lake Dams DATE 11/28/78
 PROJECT FEATURE Intake Channel, Structural NAME Cole, Decker
 DISCIPLINE Structural, Geotechnical NAME Bisson
Hydraulics/Hydrology

| AREA EVALUATED | | CONDITION |
|---|--------------|-------------------------------------|
| <u>OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE</u> | | |
| | South Dam | North Dam |
| a. Approach Channel | | |
| Slope Conditions | Flat, stable | Flat, stable |
| Bottom Conditions | Gravel | Ice covered, could not be observed. |
| Rock Slides or Falls | None | None |
| Log Boom | None | None |
| Debris | None | Beaver workings |
| Condition of Concrete Lining | N/A | N/A |
| Drains or Weep Holes | N/A | N/A |
| b. Intake Structure | | |
| Condition of Concrete | N/A | Timber, poor |
| Stop Logs and Slots | N/A | Timber, poor |

INSPECTION CHECKLIST

PROJECT Rocky Lake Dams DATE 11/28/78
 PROJECT FEATURE Control Tower NAME Cole, Decker
 DISCIPLINE Structural, Civil NAME Bisson
Hydraulics/Hydrology

| AREA EVALUATED | CONDITION | |
|--|---|--|
| <u>OUTLET WORKS - CONTROL TOWER</u> | South Dam | North Dam |
| a. Masonry and Structural | | |
| General Condition | Old timber dam downstream of earth dike has been breached. Control tower has collapsed. | Control tower consists of deteriorated timber stop log bays. |
| Condition of Joints | | |
| Spalling | | |
| Visible Reinforcing | | |
| Rusting or Staining of Concrete | | |
| Any Seepage or Efflorescence | | |
| Joint Alignment | | |
| Unusual Seepage or Leaks in Gate Chamber | | |
| Cracks | | |
| Rusting or Corrosion of Steel | | |
| b. Mechanical and Electrical | | |
| Air Vents | | Stop log bays are inoperable and filled with debris. |
| Float Wells | N/A | |
| Gate Hoist | | |
| Elevator | | |

| AREA EVALUATED | | CONDITIONS |
|---|-----------|-----------------------------|
| <u>OUTLET WORKS - CONTROL TOWER (cont.)</u> | South Dam | North Dam |
| Hydraulic System | N/A | Stop log bays inoperable |
| Service Gates | | |
| Emergency Gates | | |
| Lightning Protection System | | |
| Emergency Power System | | |
| Wiring and Lighting System | | |

INSPECTION CHECKLIST

PROJECT Rocky Lake Dams DATE 11/28/78
 PROJECT FEATURE Transition, conduit NAME Cole, Bisson
 DISCIPLINE Structural, Civil NAME Decker
Hydraulics/Hydrology

| AREA EVALUATED | CONDITION | |
|--|--------------------|---------------------|
| <u>OUTLET WORKS - TRANSITION AND CONDUIT</u> | South Dam | North Dam |
| General Condition of Concrete | Old timber dam | Deteriorated timber |
| Rust or Staining on Concrete | has been breached. | sill and training |
| Spalling | | walls. Intact but |
| Erosion or Cavitation | | badly rotted. |
| Cracking | NOT APPLICABLE | |
| Alignment of Monoliths | | |
| Alignment of Joints | | |
| Numbering of Monoliths | | |

PERIODIC INSPECTION CHECKLIST

PROJECT Rocky Lake Dams DATE 11/28/78
 PROJECT FEATURE Outlet Structure, Channel NAME Cole, Decker
 DISCIPLINE Structural, Geotechnical NAME Bisson
Hydraulics/Hydrology

| AREA EVALUATED | CONDITION | |
|---|---|---|
| <u>OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL</u> | South Dam | North Dam |
| General Condition of Concrete | Old timber dam | Outlet structure |
| Rust or Staining | has been breached. | consists of timber |
| Spalling | | cribwork, badly |
| Erosion or Cavitation | | rotted. |
| Visible Reinforcing | NOT APPLICABLE | |
| Any Seepage or Efflorescence | | |
| Condition at Joints | | |
| Drain holes | | |
| Channel | | |
| Loose Rock or Trees Overhanging Channel | None | Trees in channel and on both sides of channel. |
| Condition of Discharge Channel | Bedrock, some cobbles and boulders. 8.8'x 11.8' culvert just below dam. | Channel bed consists of cobbles, gravel and boulders, no erosion evident. |

INSPECTION CHECKLIST

PROJECT Rocky Lake DamsDATE 11/28/78PROJECT FEATURE SpillwayNAME Cole, DeckerDISCIPLINE Structural, Civil
Hydraulics/HydrologyNAME Bisson

| AREA EVALUATED | CONDITION | |
|----------------|-----------|--|
|----------------|-----------|--|

OUTLET WORKS - SPILLWAY WEIR, APPROACH
AND DISCHARGE CHANNELS

South Dam

North Dam

a. Approach Channel

General Condition

Good

Good

Loose Rock Overhanging Channel

None

None

Trees Overhanging Channel

None

None

Floor of Approach Channel

Bedrock, gravel,
cobbles, bouldersCould not be ob-
served, ice

b. Weir and Training Walls

General Condition of Concrete
and Masonry

Timber dam breached.

Timber cribwork,
very rotten.

Rust or Staining

Spalling

NOT APPLICABLE

Any Visible Reinforcing

Any Seepage or Efflorescence

Drain Holes

c. Discharge Channel

General Condition

Loose Rock Overhanging Channel

None

None

Trees Overhanging Channel

None

Trees in channel

Floor of Channel

Bedrock, cobble and
bouldersGravel, cobbles an
boulders

Other Obstructions

Culvert just down-
stream

None

INSPECTION CHECKLIST

PROJECT Rocky Lake Dam DATE 11/28/78
 PROJECT FEATURE Service Bridge NAME Cole
 DISCIPLINE Structural NAME _____

| AREA EVALUATED | CONDITION |
|----------------|-----------|
|----------------|-----------|

OUTLET WORKS - SERVICE BRIDGE

a. Superstructure

Bearings

Anchor Bolts

Bridge Seat

Longitudinal Members

NOT APPLICABLE

Under Side of Deck

Secondary Bracing

Deck

Drainage System

Railings

Expansion Joints

Paint

b. Abutment & Piers

General Condition of Concrete

Alignment of Abutment

Approach to Bridge

Condition of Seat & Backwall

SUPPLEMENTARY INSPECTION NOTES

ROCKY LAKE DAMS WHITING, MAINE

APPENDIX A

The Rocky Lake Dams consists of two structures about 400 feet apart and separated by an island. The spillway section of the southerly dam has been breached. The breached width is approximately 20 feet and the stream is flowing in its natural streambed through this opening. The northerly dam was found to be retaining approximately 10 feet of water.

1. TIMBER STRUCTURES IN GENERAL

Both dams are constructed of stone-filled self-loading timber cribs. The timber members are seriously deteriorated and rotted. The broken timber members have become displaced and stone fill has fallen through. The penstock area and powerhouse at the southerly dam have collapsed and could not be inspected due to the hazardous condition of the dilapidated structure. The northerly dam, although seriously deteriorated is generally intact.

2. EMBANKMENT STRUCTURES

An earth embankment dike, located approximately 150 feet upstream of the southerly dam, partially closes the southerly outlet from Rocky Lake. This embankment is approximately 6 feet high with about an 8 foot top width and 2 to 1 side slopes. This embankment has a grassed surface and appears to be well maintained with little or no brush growth apparent. This embankment appears to have been constructed subsequent to the breaching of the dam downstream.

The embankment does not entirely close off the southerly outlet channel. It appears that the embankment was either not extended across the channel or has been breached. The channel is partially filled with stones and retains approximately 1 to 2 feet of water.

- a. Settlement. The southerly earthen embankment dike section was found to be in good condition with little or no settlement.

- b. Slope Stability. The slopes of the embankment appear generally true to line and grade and no slope stability problem appears to exist.
- c. Seepage. Very minor seepage was occurring at the downstream toe of this structure.
- d. Drainage Systems. None were observed.
- e. Slope Protection. Logs were lying on the upstream slope of the northerly dam, a little above the water line. No other form of slope protection was in evidence. Little or no erosion was apparent on the upstream slope.

3. SPILLWAY STRUCTURES

The spillway structure at the southerly dam has been breached. The northerly dam has a timber self-loading timber deck spillway. The timber is seriously deteriorated and in poor condition. There are no control gates on the spillway.

a. Control Gates and Operating Machinery.

None operable.

- b. Unlined Saddle Spillways. The area north of the earth embankment dike upstream of the southerly dam is an unlined saddle spillway. It is about 40 feet in width, and consists of cobbles and boulders overlying bedrock.

- c. Approach and Outlet Channels. Southerly dam approach appears to be clear and unobstructed both at the embankment dike upstream and at the breached dam. The southerly dam outlet channel is generally unobstructed, however, a 8.8 foot wide by 11.4 foot high culvert exists approximately 100 feet downstream from the dam. Debris from the old timber deck spillway could plug this culvert during high flow conditions. The approach channel to the northerly dam was generally clear. However, a beaver lodge exists approximately 30 feet upstream of the dam near the north bank and debris from this area could clog the spillway or outlet sections of the dam structure. The outlet channel is lined with trees and could be easily obstructed by debris from the dam or debris passing over the dam.

d. Stilling Basin. The stilling basin at the southerly dam is a bedrock channel with no erosion apparent. The stilling basin at the northerly dam is a channel, no erosion was evident.

e. Drawdown Facilities. There are no drawdown facilities at either dam. Although the south dam has been breached, the lake outlet channel has been partially filled with stone to a height of about 2 feet, and at low flows the stone fill controls hydraulically. The north dam gates are inoperable.

4. OUTLET WORKS

There are no outlet works at the southerly dam. At the northerly dam there are two stop log outlet structures. One has been closed with vertical planking over the deteriorated stop logs. The other outlet has apparently been closed by debris and the work of beavers.

5. SAFETY AND PERFORMANCE INSTRUMENTATION

There is no safety performance instrumentation at the dam.

6. RESERVOIR

a. Shoreline. No major active or inactive landslide areas on the Rocky Lake shoreline were observed.

b. Sedimentation. The extent of sedimentation in the pond could not be observed during the visual inspection, but it does not appear to impede flow to either of the two dams.

c. Potential Upstream Hazard Area. No significant upstream hazard was observed.

d. Watershed Runoff Potential. The watershed is essentially rural with flat to mildly sloping terrain.

7. DOWNSTREAM CHANNEL

The channels below the northerly and southerly dams are narrow with a slope of about 0.7 percent. See Photographs 5 and 7. Both streambeds are composed primarily of gravel and cobbles. Located about 100 feet downstream of the southerly dam is an 8.8 foot wide by

11.8 foot high culvert beneath a road. This culvert appears to restrict the channel and is the hydraulic control during flood flow. The north channel is littered with debris, including two fallen trees. The two channels join as they enter Orange Lake about 1500 feet downstream of the dams.

8. OPERATION AND MAINTENANCE FEATURES

- a. Maintenance. Based on the observations made and information reported by a local resident, no maintenance has been performed on the dam in the past 10 years. It was reported that the southerly dam was breached approximately 10 years ago.

APPENDIX B

ENGINEERING DATA

This appendix lists the engineering data collected either from project records or other sources of data developed as a result of the visual inspection. The contents of this appendix are listed below.

| <u>Appendix</u> | <u>Description</u> |
|-----------------|----------------------|
| B-1 | General Project Data |

B-1

Rocky Lake Dam

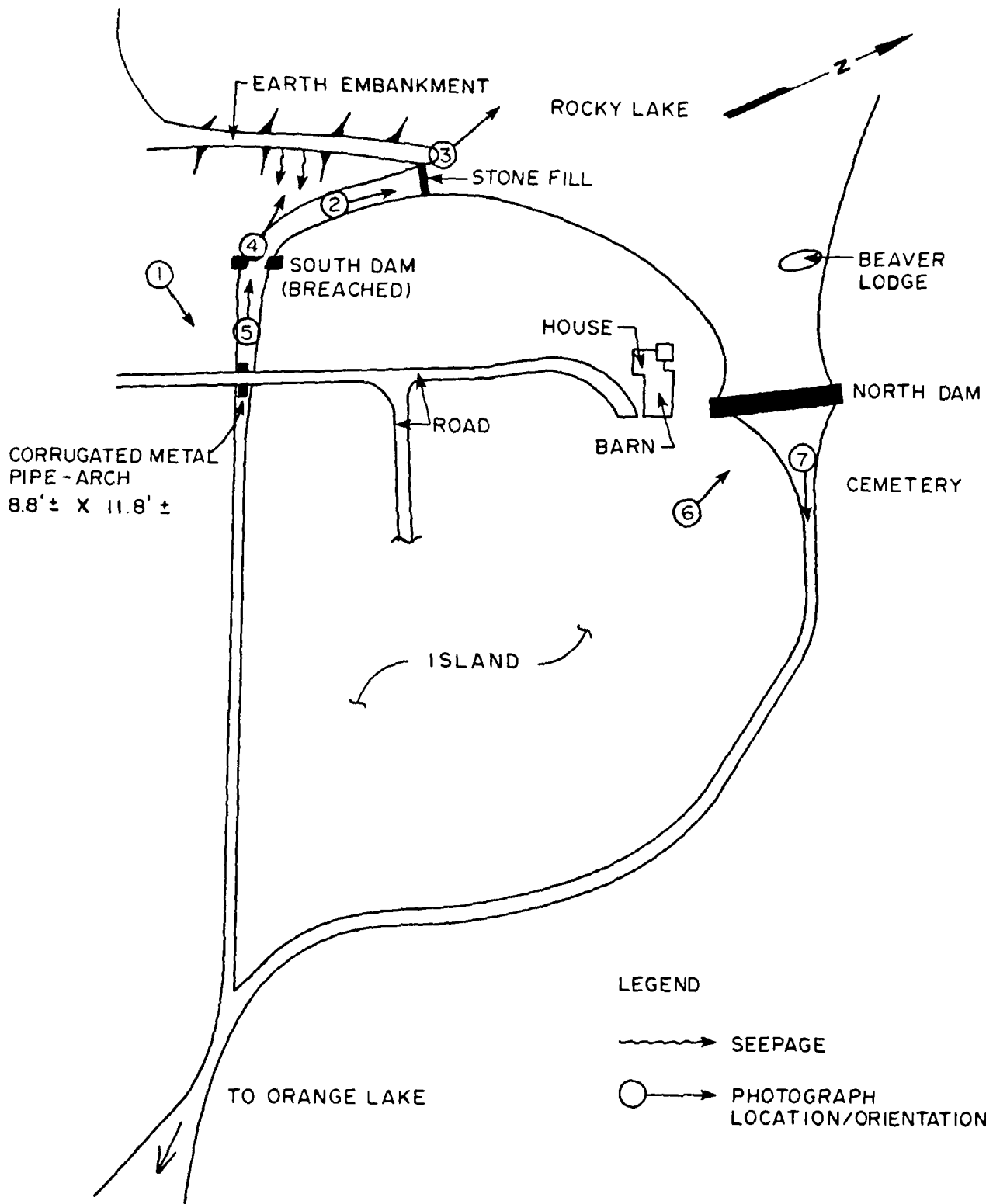
APPENDIX B-1

GENERAL PROJECT DATA

The following plan, profile and cross-sections of the dams were developed from a limited stadia survey performed during visual inspection, field notes taken by inspection team members, and photographs taken during the visual inspection. The survey was referenced to an arbitrary local datum. Approximate U.S.G.S. elevations were obtained by noting the dam's location on the Gardner Lake, Maine U.S. Geologic Survey quadrangle and assuming that the spillway crest of the northerly dam to be equal to normal water surface of approximate elevation 90 (MSL).

B-1.1

Rocky Lake Dam

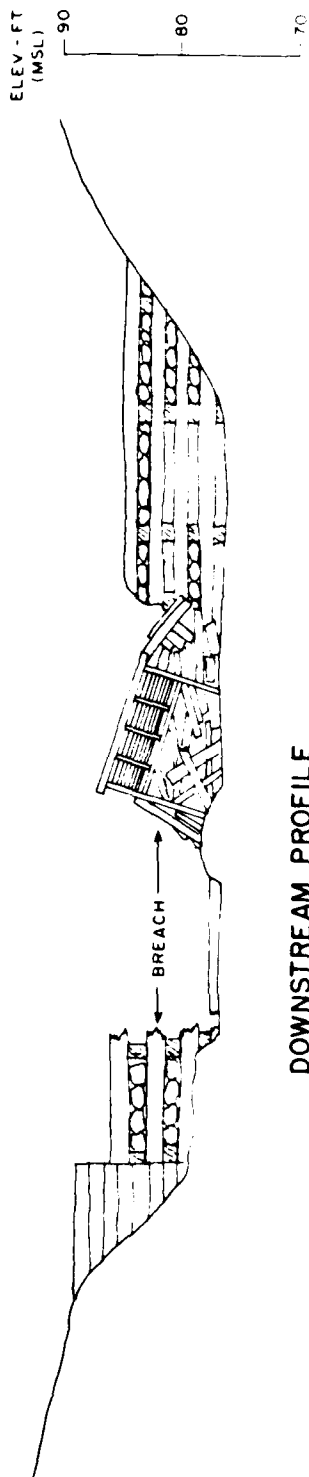
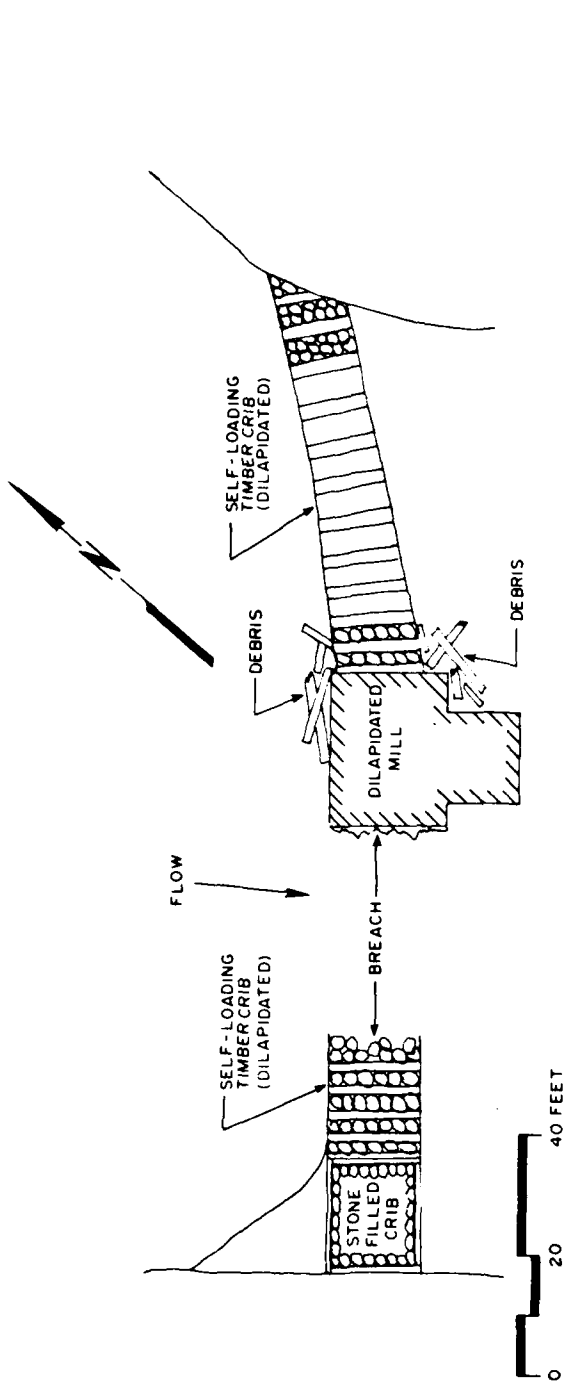


NOT TO SCALE

8-1.2

2079915

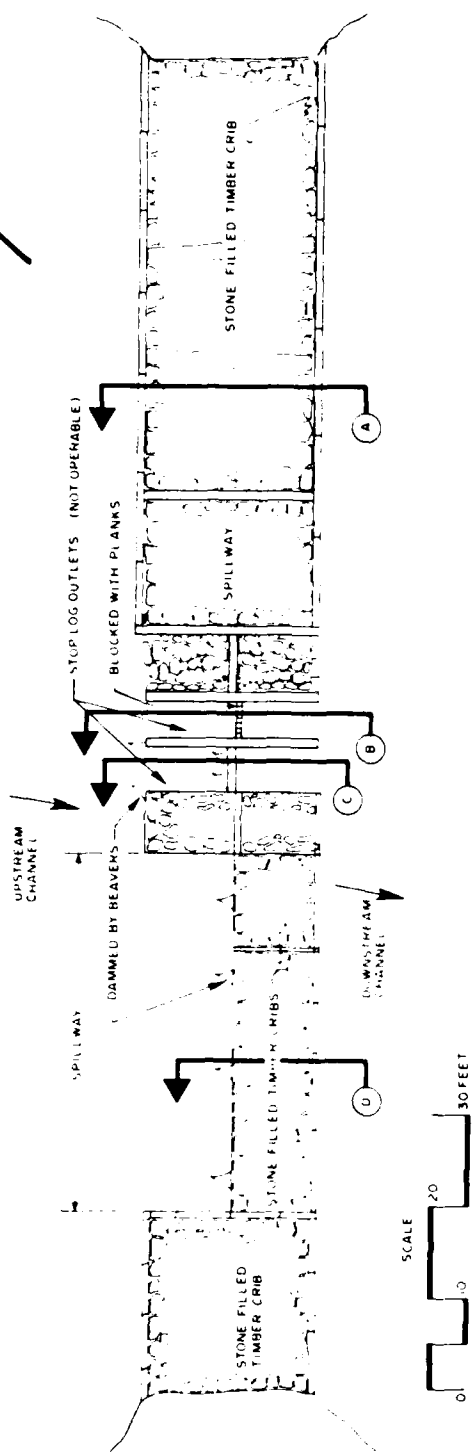
| | |
|--|---|
| EDWARD C. JORDAN CO., INC. PORTLAND, ME 04101 | U.S. ARMY CORPS OF ENGINEERS PORTLAND, ME 04101 |
| NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS | |
| ROCKY LAKE DAMS GENERAL SITE SKETCH | |
| ORANGE RIVER | MAINE |
| DATE: MARCH 1978 | |



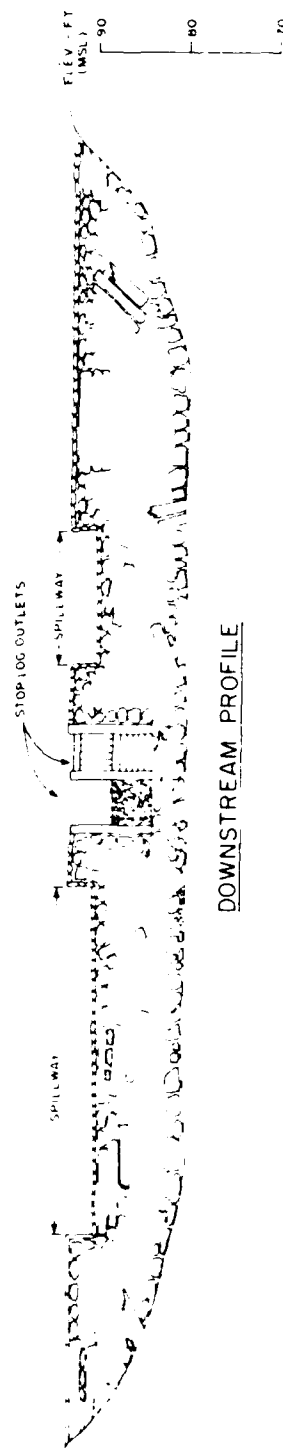
| | | | |
|--|--|------------------------------------|--|
| EDWARD J. JOHAN, JR. NC | | U.S. ARMY ENGINEER DISTRICT OFFICE | |
| PORT AND BE ME | | BOSTON, MASS. | |
| NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS | | | |
| ROCKY LAKE DAMS | | | |
| SOUTHERLY DAM | | | |
| PLAN AND PROFILE | | | |
| ORANGE RIVER | | MAINE | |
| SCALE | | DATE MARCH 1975 | |

2079915

B-1.3



PLAN

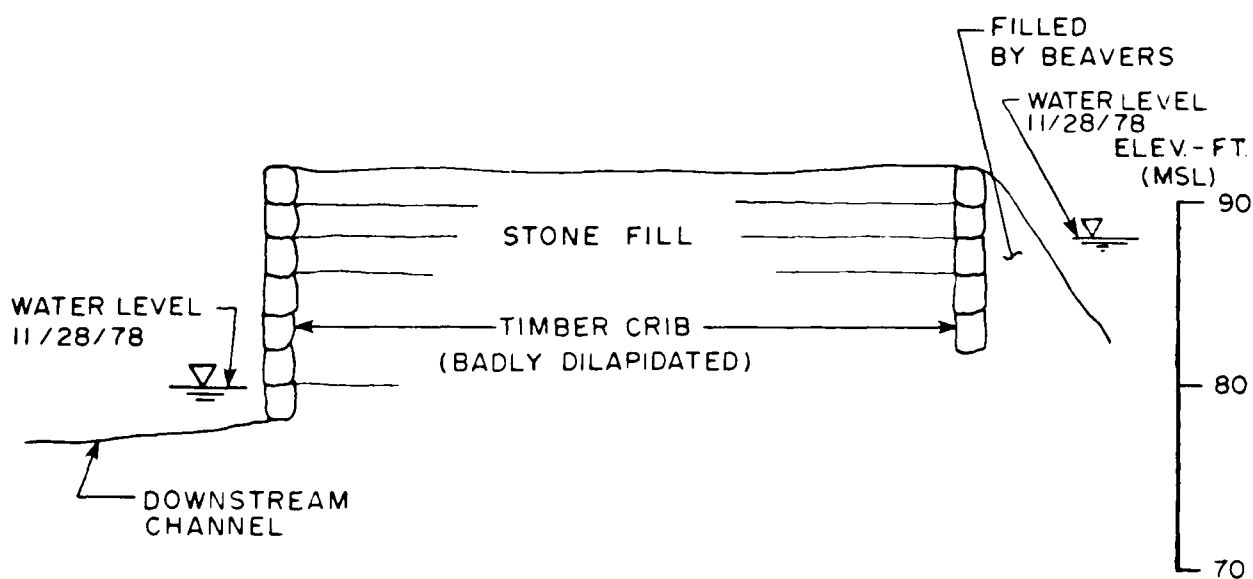


DOWNSTREAM PROFILE

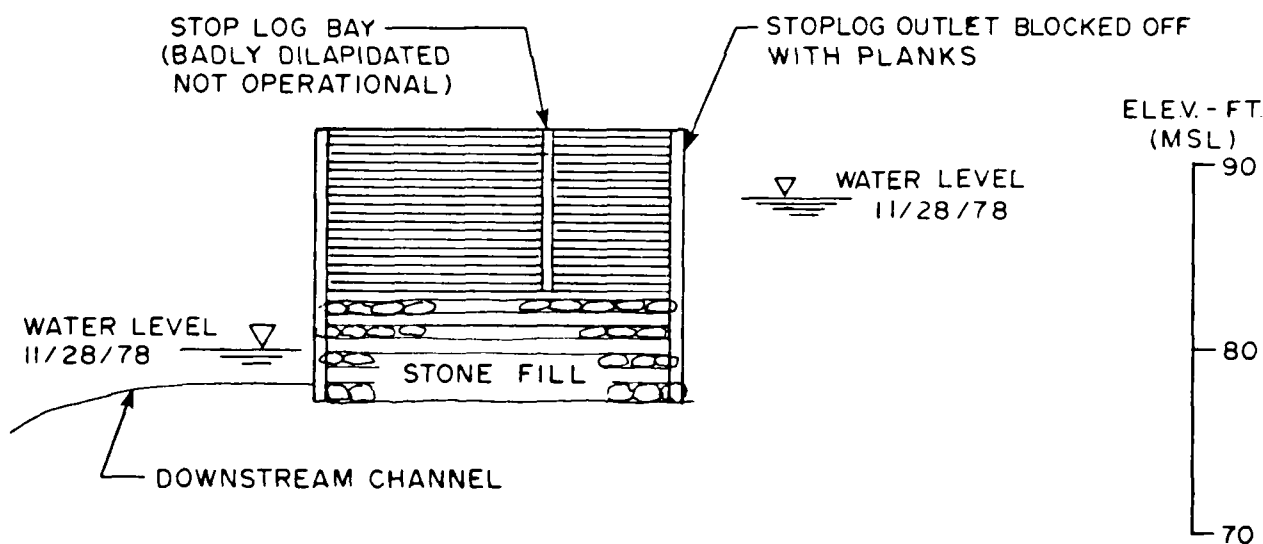
2079915

B-1.4

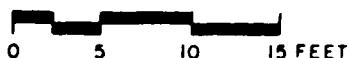
| | |
|--|------------------------------|
| DESIGNED BY: JORDAN, D. MC | U.S. ARMY ENGINEERING CENTER |
| PROJECT NO.: 100-100 | REPORT NO.: 100-100 |
| NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS | |
| ROCKY LAKE DAMS | |
| NORTHERLY DAM | |
| PLAN AND PROFILE | |
| ORANGE RIVER | MAINE |
| SCALE | DATE: MAY 1979 |



SECTION A



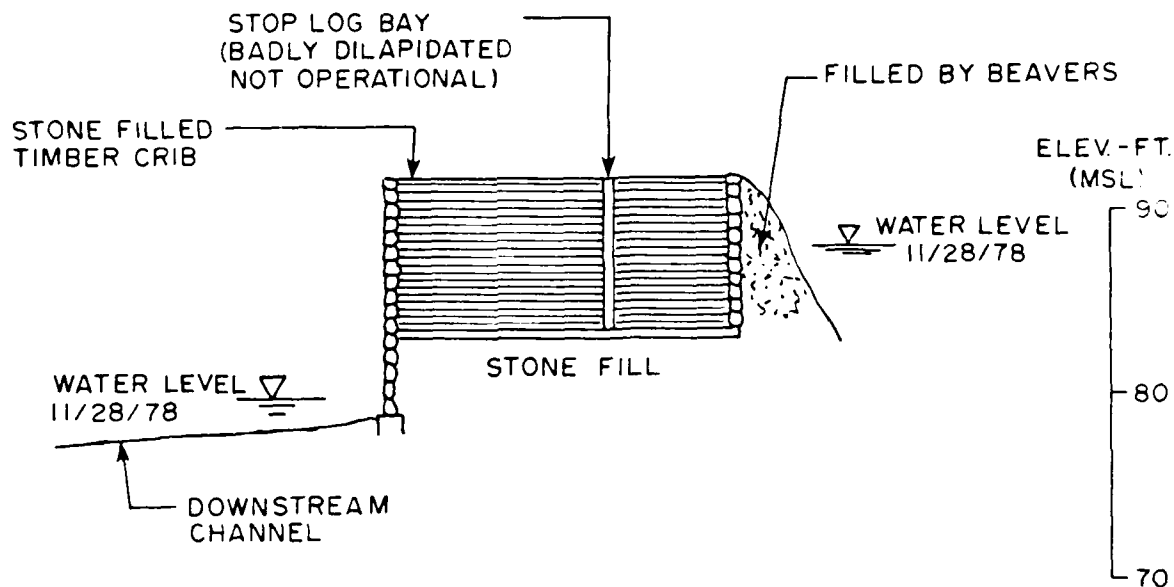
SECTION B



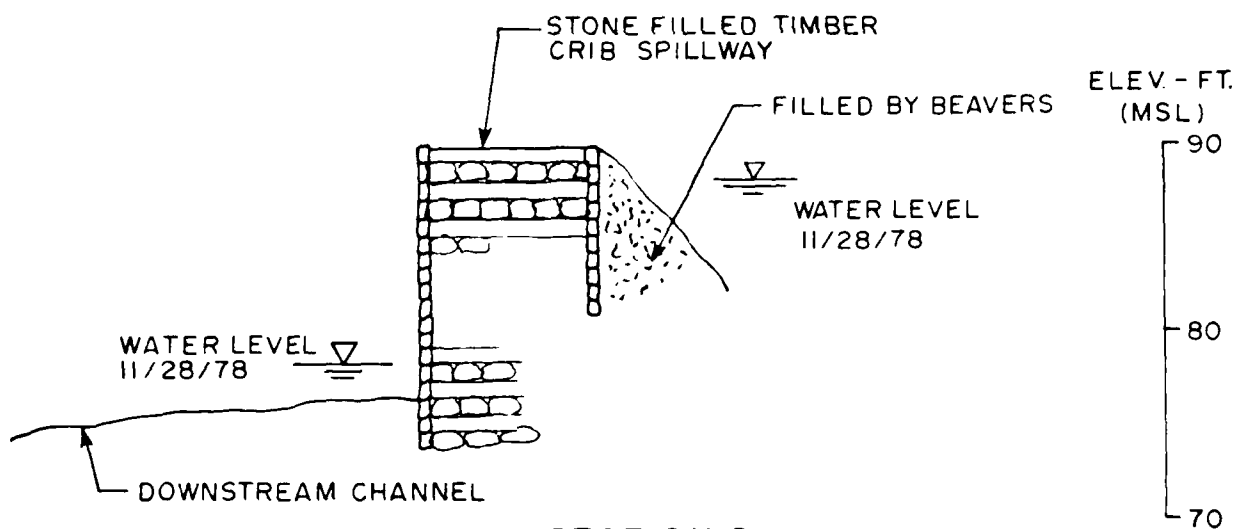
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B-1.5

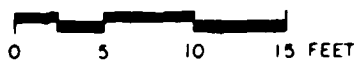
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|--|--|------------------------------|--|
| FORM NO. 1 (REV. 10-66) | | U.S. ARMY CORPS OF ENGINEERS | |
| NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS | | | |
| ROCKY LAKE DAMS | | | |
| NORTHERLY DAM | | | |
| X-SECTIONS | | | |
| ORANGE RIVER | | MAINE | |
| DATE | | SCALE | |
| 11/28/78 | | 1" = 10' | |



SECTION C



SECTION D



2079915

B-1.6

| | | |
|--|-------|--|
| FORWARD APPROVED BY | DATE | U.S. ARMY ENGINEER REGIMENT, 100TH AVIATION BRIGADE, 100TH AIRBORNE DIVISION, 100TH AIRBORNE DIVISION, 100TH AIRBORNE DIVISION |
| NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS | | |
| ROCKY LAKE DAMS | | |
| NORTHERLY DAM | | |
| X-SECTIONS | | |
| ORANGE RIVER | MAINE | |
| | | DATE 11/28/78 |

APPENDIX C

PHOTOGRAPHS

The following are photographs referenced in this report.
See Sheet B-1 for photograph locations and orientations.



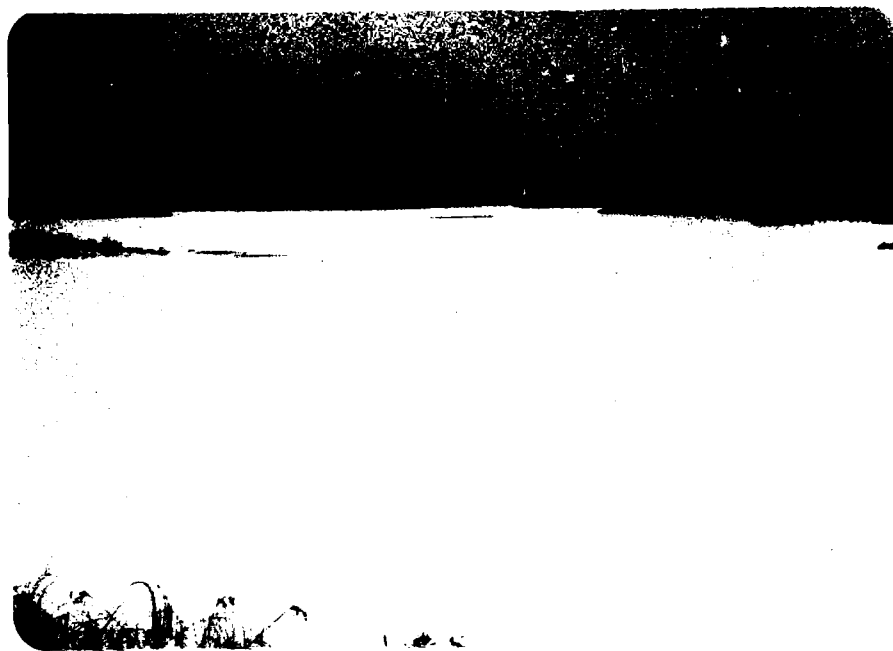
1

SOUTH DAM - DOWNSTREAM FACE



2

NORTH DAM - DOWNSTREAM FACE



3

UPSTREAM CHANNEL



4

SOUTH DAM - EARTH DIKE UPSTREAM



5

SOUTH DAM - DOWNSTREAM CHANNEL



6

SOUTH DAM - UPSTREAM CONTROL



7

NORTH DAM - DOWNSTREAM CHANNEL



3

UPSTREAM CHANNEL



4

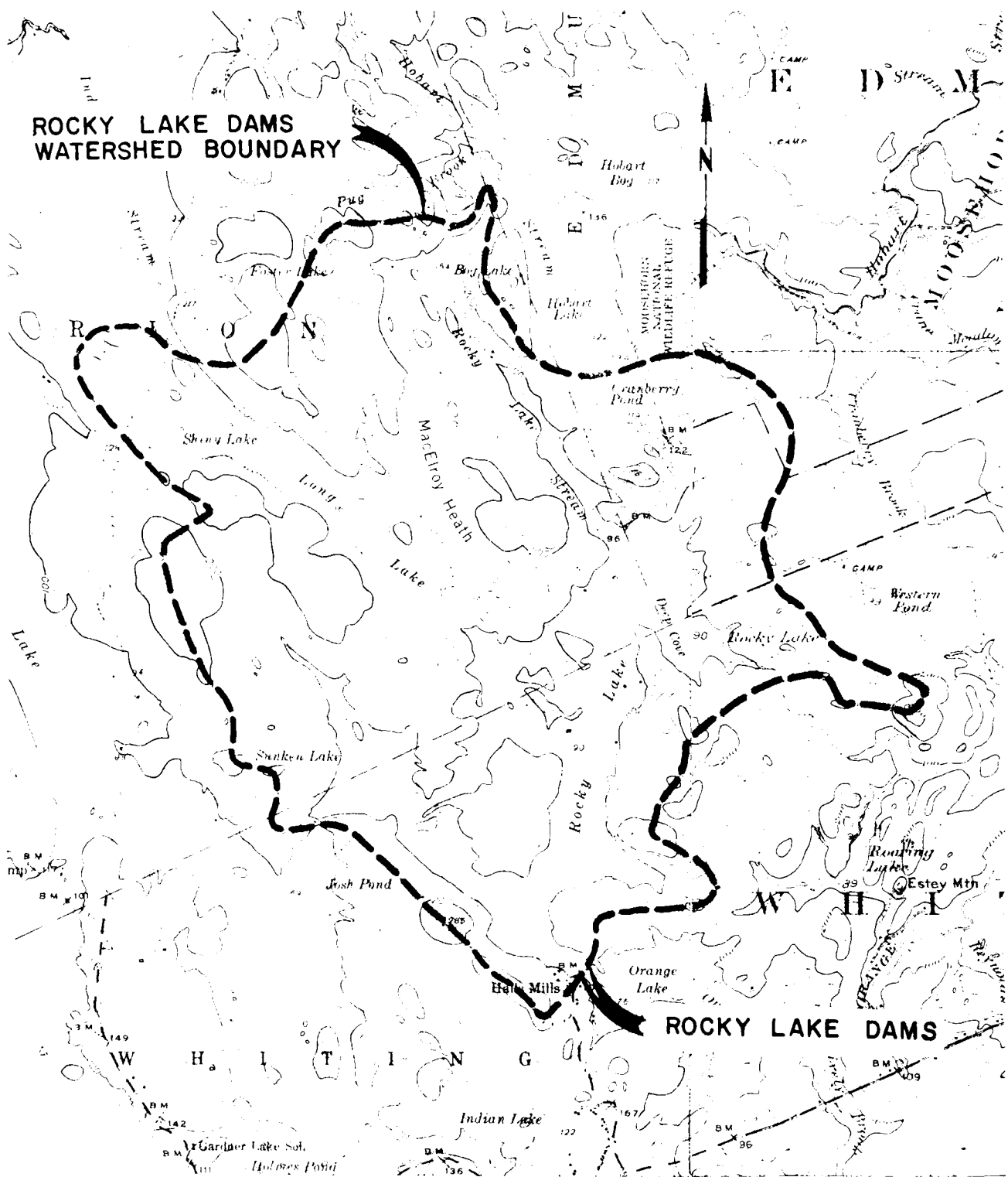
SOUTH DAM - EARTH DIKE UPSTREAM

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

Hydrologic computations pertinent to this investigation are attached. The following Location and Drainage area map shows the Rocky Lake watershed at the Rocky Lake Dams.

ROCKY LAKE DAMS WATERSHED BOUNDARY



U.S. GEOLOGICAL SURVEY MAP
GARDNER LAKE, ME. QUADRANGLE
EASTPORT, ME. QUADRANGLE

0 1 2 3 MILES

| | | | | | |
|--|------|----|--------------------|----------------------|----|
| DATE | 1979 | BY | W. J. AND M. A. W. | APPROVED FOR RELEASE | ON |
| NATIONAL PROGRAM OF INSPECTION OF NON-FEC DAMS | | | | | |
| ROCKY LAKE DAMS | | | | | |
| LOCATION & DRAINAGE AREA MAP | | | | | |
| ROCK, LAKE | | | | ME. | |
| 2075915 | | | | AS SHOWN | |
| | | | | MARCH 1979 | |

PROJECT

STORAGE AND DISCHARGE RATING CURVE
FOR NORTH AND SOUTH DAMS

COMP BY

STL

JOB NO.

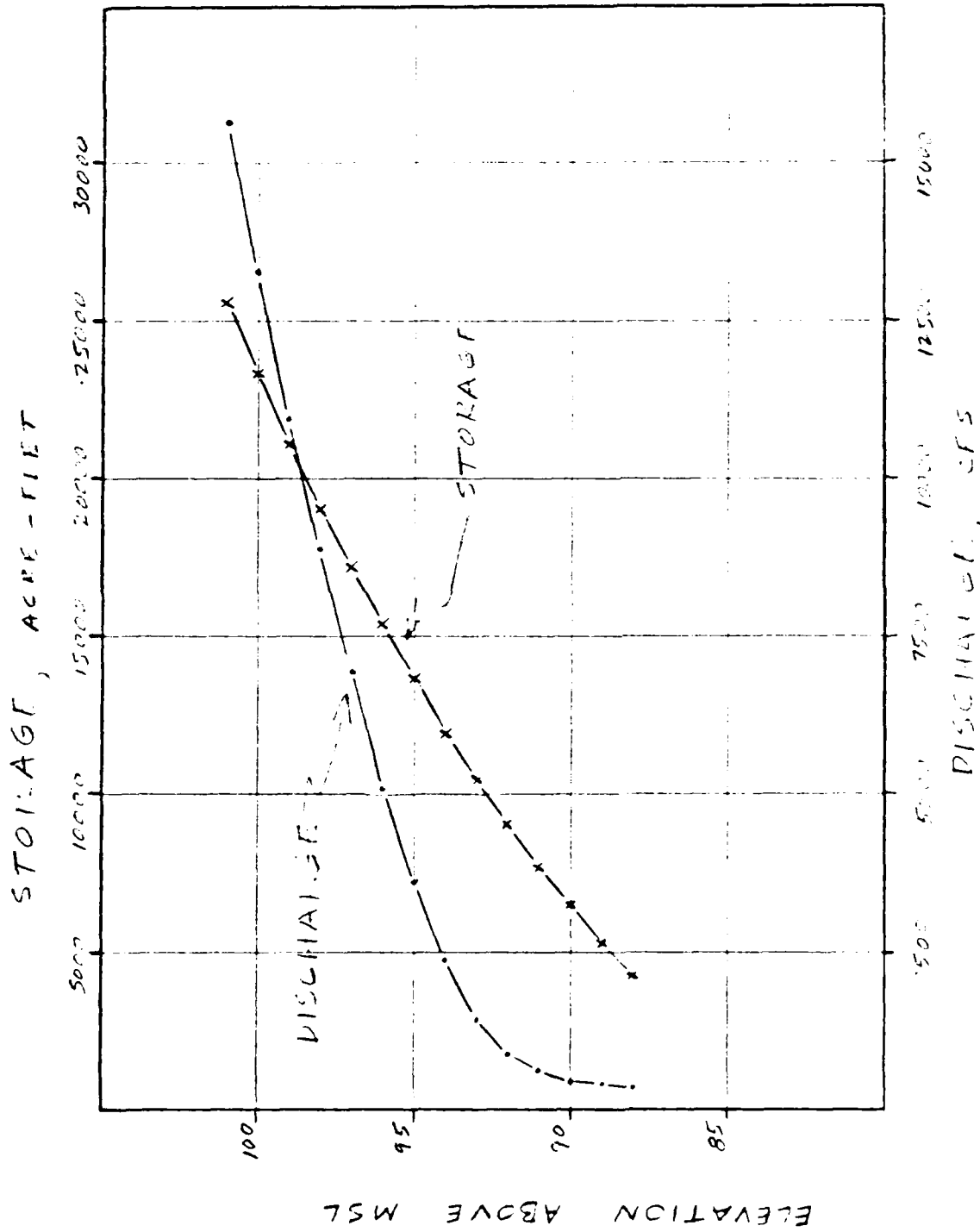
2-7-77

CHK BY

JL

DATE

3-22-77



ELEVATION ABOVE MSL

D-3

Rocky Lake Dam

| | | |
|---------------------------------------|----------------|---------------------|
| PROJECT ARCTIC EDWARDS LAKE DAM | COMP BY JTB | JOB NO. 2-177-15 |
| | CHK BY JTB | DATE 2-5-77 |

| ITEM | AREA sq. ft. In ² | AREA sq. ft. In ² | AREA sq. ft. In ² |
|----------------------|------------------------------------|------------------------------------|------------------------------------|
| Rocky Lake D.A. | 16.8 | 16.8 | 10752 |
| Rocky Lake @ EL 90 | 1.80 | 1.80 | 1152 |
| Rocky Lake @ EL 100 | 3.43 | 3.43 | 2195 |
| Rocky Lake @ EL 100 | 6.00 | 6.00 | 3891 |
| Orange Lake @ EL 75 | 0.38 | 0.38 | 243 |
| Orange Lake @ EL 80 | 0.66 | 0.66 | 422 |
| Orange Lake @ EL 100 | 1.16 | 1.16 | 742 |

FINAL COE INVENTORY OF DAMS:

Normal Operating Capacity = 6512 A.-Ft.
 Maximum " " " = 9020 A.-Ft.

Normal Capacity @ 2000 ft. water level

Maximum Capacity @ Top of Dam
 (@ EL 90):

$$6512 + 1152 + \left[\frac{2195 + 3891}{2} \right] = 9020 \text{ A.-Ft.}$$

To be used for max. capacity

| | | |
|---|----------------|---------------------|
| PROJECT ROCKY LAKE DAM RECONSTRUCTION | COMP BY LTC | JOS NO. 2-777-15 |
| | CHK BY CDD | DATE 1-2-78 |

| WEIR DESIGNATION | LENGTH | C |
|------------------------|--------|------------|
| North Dam | 95 | variable ← |
| North Dam Spilling | 54 | " |
| South Dam ¹ | 63 | " |

¹ South Dam is breached. Any weir flow at the South Dam site would be over the roadway just downstream of the dam.

5-40 HANDBOOK OF HYDRAULICS
KING & KRATER
Table 5-3. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs

| Measured head in feet, H | Breadth of crest of weir in feet | | | | | | | | | | | |
|--------------------------|----------------------------------|------|------|------|------|------|------|------|------|-------|-------|--|
| | 0.50 | 0.75 | 1.00 | 1.50 | 2.00 | 2.50 | 3.00 | 4.00 | 5.00 | 10.00 | 15.00 | |
| 0.2 | 2.80 | 2.75 | 2.69 | 2.62 | 2.54 | 2.48 | 2.44 | 2.38 | 2.31 | 2.49 | 2.68 | |
| 0.4 | 2.92 | 2.80 | 2.72 | 2.64 | 2.61 | 2.60 | 2.58 | 2.54 | 2.50 | 2.56 | 2.70 | |
| 0.6 | 3.08 | 2.89 | 2.75 | 2.64 | 2.61 | 2.60 | 2.68 | 2.69 | 2.70 | 2.70 | 2.70 | |
| 0.8 | 3.30 | 3.04 | 2.85 | 2.68 | 2.60 | 2.60 | 2.67 | 2.68 | 2.68 | 2.69 | 2.64 | |
| 1.0 | 3.32 | 3.14 | 2.98 | 2.75 | 2.66 | 2.64 | 2.65 | 2.67 | 2.68 | 2.68 | 2.63 | |
| 1.2 | 3.32 | 3.20 | 3.08 | 2.86 | 2.70 | 2.65 | 2.64 | 2.67 | 2.68 | 2.69 | 2.64 | |
| 1.4 | 3.32 | 3.26 | 3.20 | 2.92 | 2.77 | 2.68 | 2.64 | 2.65 | 2.65 | 2.67 | 2.64 | |
| 1.6 | 3.32 | 3.29 | 3.28 | 3.07 | 2.89 | 2.75 | 2.68 | 2.66 | 2.65 | 2.64 | 2.63 | |
| 1.8 | 3.32 | 3.32 | 3.31 | 3.07 | 2.88 | 2.74 | 2.68 | 2.66 | 2.65 | 2.64 | 2.63 | |
| 2.0 | 3.32 | 3.31 | 3.30 | 3.03 | 2.85 | 2.76 | 2.72 | 2.68 | 2.65 | 2.64 | 2.63 | |
| 2.5 | 3.32 | 3.32 | 3.31 | 3.28 | 3.07 | 2.89 | 2.81 | 2.72 | 2.67 | 2.64 | 2.63 | |
| 3.0 | 3.32 | 3.32 | 3.32 | 3.32 | 3.20 | 3.05 | 2.92 | 2.73 | 2.66 | 2.64 | 2.63 | |
| 3.5 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.19 | 2.97 | 2.76 | 2.68 | 2.64 | 2.63 | |
| 4.0 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.07 | 2.79 | 2.70 | 2.64 | 2.63 | |
| 4.5 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 2.58 | 2.74 | 2.64 | 2.63 | |
| 5.0 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.07 | 2.79 | 2.64 | 2.63 | |
| 5.5 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 2.88 | 2.64 | 2.63 | |

| | | |
|---|----------------|------------------|
| PROJECT ROCKY LAKE DAM HYDRA LICS NORTH DAM | COMP BY BTL | JOB NO. E-730 |
| | CHK BY SS | DATE 11-2-77 |

| MSL DATE ELEV | SP. IN HEAD FEET | SP. IN G CFS | LINE HEAD FEET | LINE G CFS | TOTAL LINE G CFS |
|---------------------|------------------------|--------------------|----------------------|------------------|---------------------------|
| 9.0 | 0 | - | - | - | 100 |
| 9.1 | 1 | 143 | - | - | 403 |
| 9.2 | 2 | 403 | 0 | - | 911 |
| 9.3 | 3 | 741 | 1 | 250 | 1847 |
| 9.4 | 4 | 1140 | 2 | 707 | 2817 |
| 9.5 | 5 | 1514 | 3 | 1298 | 4014 |
| 9.6 | 6 | 2095 | 4 | 1999 | 5423 |
| 9.7 | 7 | 2640 | 5 | 2793 | 6817 |
| 9.8 | 8 | 3226 | 6 | 3672 | 8476 |
| 9.9 | 9 | 3849 | 7 | 4607 | 10161 |
| 10.0 | 10 | 4508 | 8 | 5653 | 11147 |
| 10.1 | 11 | 5201 | 9 | 6746 | 13221 |
| 10.2 | 12 | 5906 | 10 | 7901 | 15771 |
| 10.3 | 13 | 6682 | 11 | 9115 | 17854 |
| 10.4 | 14 | 7468 | 12 | 10386 | 19513 |
| 10.5 | 15 | 8212 | 13 | 11711 | 21113 |
| 10.6 | 16 | 9004 | 14 | 13081 | 22513 |
| 10.7 | 17 | 9811 | 15 | 14513 | 23513 |
| 10.8 | 18 | 10627 | 16 | 15911 | 24513 |
| 10.9 | 19 | 11451 | 17 | 17311 | 25513 |
| 11.0 | 20 | 12281 | 18 | 18711 | 26513 |

| | | |
|---------------------------|----------------|--------------------|
| PROJECT ROCKY LAKE DAM | COMP BY LTC | JOB NO. 5-75-11 |
| | CHK BY J | DATE 2-6-75 |

25.11.75
RECAJ

| DATE ELEV | CULVERT AREA SQ | CULVERT FLOW CFS | WEIR CFS | TOTAL CULVERT FLOW |
|--------------|-----------------------|------------------------|-------------|--------------------------|
| 75 | 2.5 | 35 | | 35 |
| 80 | 18.1 | 102 | | 102 |
| 85 | 34.3 | 193 | | 193 |
| 90 | 51.5 | 284 | | 284 |
| 95 | 66.1 | 371 | | 371 |
| 100 | 77.4 | 435 | | 435 |
| 105 | 81.7 | 457 | | 457 |
| 110 | | | 27 | 457 |
| 115 | | | 246 | 715 |
| 120 | | | 578 | 1023 |
| 125 | | | 993 | 1422 |
| 130 | | | 1011 | 1936 |
| 135 | | | 2021 | 2411 |
| 140 | | | 2620 | 3071 |
| 145 | | | 3202 | 3721 |
| 150 | | | 3961 | 4411 |
| 155 | | | 4671 | 5151 |
| 160 | | | 5111 | 5926 |
| 165 | | | 6374 | 6751 |
| 170 | | | 7107 | 7656 |
| 175 | | | 8037 | 8411 |
| 180 | | | 8511 | 9211 |
| 185 | | | 9916 | 10237 |
| 190 | | | 10904 | 11352 |

1 since no water was observed for stream in 1 ft. depth, it be 1.0 foot.

D-7

Rocky Lake Dam

| | | |
|------------------------------------|----------------|--------------------|
| PROJECT STATION 1 - 250' - 100' | COMP BY BTE | JOB NO. 2579115 |
| | CHK BY CC | DATE 2-5-77 |

| | | |
|---------|--------|---------|
| MS- | TOTAL- | 1 |
| LAT 11' | ELEV | STORAGE |
| ELEV | FEET | ACFT |

| | | |
|-----|-------|-------|
| 88 | 371 | 4206 |
| | 403 | 5357 |
| 90 | 435 | 6510 |
| | 570 | 7714 |
| 92 | 562 | 8023 |
| | 1450 | 10435 |
| 94 | 2222 | 11751 |
| | 3577 | 13504 |
| 96 | 5131 | 15247 |
| | 6575 | 17121 |
| 98 | 8234 | 19064 |
| | 10957 | 21171 |
| 100 | 13240 | 23247 |
| | 15674 | 25511 |
| 102 | 18242 | 27974 |
| | 20955 | 30573 |
| 104 | 23771 | 33211 |
| | 26746 | 36340 |
| 106 | 27212 | 39467 |
| | 33013 | 42765 |
| 108 | 36276 | 46231 |
| | 37275 | 49567 |
| 110 | 42194 | 53675 |

* Normal water surface taken as ELEV.

| | | |
|------------------------------|----------------|--------------------|
| PROJECT PMT - 1000 - 1000 | COMP BY ETC | JOB NO. 2571-15 |
| | CHK BY ETC | DATE 2-5-70 |

According to "PROCEDURE & GUIDANCE FOR ESTIMATING MAX PROBABLE DISCHARGE" by CCE

For Flat D.A. = 10 ft $\frac{1}{4}$ M., $Q = 65$ CSM

$$Q = 65 (15\%) = 10750 \text{ CFS} = \text{PME}$$

$$5460 \text{ CFS} = \frac{1}{2} \text{ PMF}$$

ESTIMATING EFFECT OF SURCHARGE STORAGE:

$$Q_{P2} = Q_{P1} \times \left(1 - \frac{\text{STOR}_1}{\text{Pmf} \cdot t}\right)$$

$$\text{PME Pmf} \cdot t = 19'' ; \frac{1}{2} \text{ PMF Pmf} \cdot t = 9.5''$$

$$\text{Elev to pass } Q_{P2} (\text{PME}) = \underline{77.5'}$$

$$\text{STOR}_1 = 21102 - 4000 = 16270 \text{ AC} \cdot \text{ft}$$

$$\text{OR } \frac{16270}{10750} \times \frac{12 \text{ in}}{1 \text{ ft}} = 18.26''$$

$$Q_{P2} = 10920 \left(1 - \frac{18.26}{19}\right) = 82$$

$$\text{STOR}_2 \approx 0$$

$$Q_{P3} = 10920 \left(1 - \frac{(18.26 + 0)/2}{19}\right) = 5500$$

$$\text{Elev to pass } Q_{P3} = \underline{96.2}$$

| | | |
|--------------------------------|----------------|-------------------|
| PROJECT D-10 ROCKY LAKE DAM | COMP BY LTI | JOB NO. 202-15 |
| | CHK BY LTI | DATE 2-5-70 |

$$STOR_3 = 15000 - 4000 = 11000 \text{ A.F.}$$

$$\text{or } \frac{11477}{10752} \times 12 = 12.7$$

$$STOR_{AVE} = \frac{12.7 + 11.4}{2} = 12.05$$

$$Q_{p4} = 10900 \left(1 - \frac{12.05}{12.7}\right) = 4520$$

$$\text{Elev. to pass } Q_{p4} = 95.6$$

$$STOR_4 = 14622 - 4000 = 10622 \text{ A.F.}$$

$$\text{or } \frac{10416}{10752} \times 12 = 11.63$$

$$STOR_{AVE} = \frac{11.63 + 12.05}{2} = 11.84$$

$$Q_{p5} = 10900 \left(1 - \frac{11.84}{12.7}\right) = \underline{\underline{4354 \text{ CFS}}}$$

$$\text{Elev. to pass } Q_{p5} = \underline{\underline{95.5'}}$$

| | | |
|--------------------------------|----------------|--------------------|
| PROJECT V ₂ P.A. | COMP BY DTL | JOB NO. 2070015 |
| | CHK BY JL | DATE 2-5-77 |

Elev. to pass Q_{p2} (K.T. 1) = 546.0
is 93.2'

$$STOR_1 = 15042 - 4200 = 11430 \text{ A. Ft.}$$

$$OR \frac{11430}{1.75} \times 12 = 78.76"$$

$$Q_{p2} = 5460 \left(1 - \frac{78.76}{9.5}\right) < 0$$

$$\therefore STOR_2 = 0, \text{ \& } STOR_{AVE} = \frac{0 + 78.76}{2} = 39.38"$$

$$Q_{p2} = 5460 \left(1 - \frac{39.38}{9.5}\right) = 1775 \text{ cfs}$$

Elev. to pass Q_{p3} = 93.4

$$STOR_3 = 11072 - 4200 = 7072 \text{ A. Ft.}$$

$$OR \frac{7072}{1.75} \times 12 = 48.11"$$

$$STOR_{AVE} = \frac{78.76 + 48.11}{2} = 63.43"$$

$$Q_{p3} = 5460 \left(1 - \frac{63.43}{9.5}\right) = 1440 \text{ cfs}$$

Elev. to pass Q_{p4} = 93.0

$$STOR_4 = 10435 - 4200 = 6227 \text{ A. Ft.}$$

$$OR \frac{6227}{1.75} \times 12 = 42.75"$$

$$STOR_{AVE} = \frac{63.43 + 42.75}{2} = 53.09"$$

$$Q_{p5} = 5460 \left(1 - \frac{53.09}{9.5}\right) = 1450 \text{ cfs}$$

D-11

Rocky Lake Dam

| | | |
|---------------------------------------|----------------|------------------|
| PROJECT Rocky Lake Dam Hydrographs | COMP BY BTE | JOB NO. 7-1-1 |
| | CHK BY BTE | DATE 1-1-71 |

$$Q_p = 9/10 W_b \sqrt{Y_0^{3/2}}$$

$$Y_0 = Q_p T = 12.1 \text{ s}$$

Note: Dam is most vulnerable to failure

$$v_b = 0.4 (147) = 58.8$$

$$Y_0 = 14'$$

$$Q_{p2} = 9/10 (58.8) \sqrt{14'}^{3/2} = 5700 \text{ cfs}$$

Top of Dam at EL 92

Assumed Flow in Canyon River
equal to flow over spillway at
EL 92 = 4000 cfs

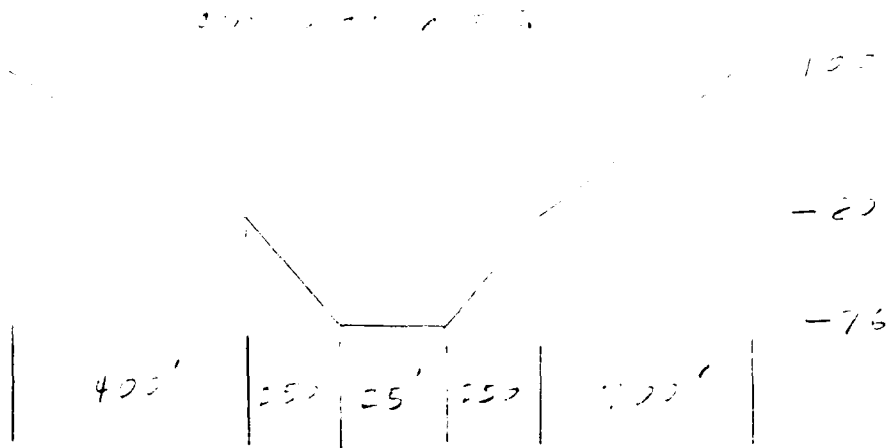
$$\text{T-1-1 Failure Flow}^1 \approx \underline{5700 \text{ cfs}}$$

$$\text{Storage} = 9000 \text{ A-c-ft}$$

$$T = \frac{12.1 (9000)}{1/2 (5700)} = \underline{38.3 \text{ hrs}}$$

¹ Failure is assumed to occur through the spillway section. Therefore, no additional flow is added to the total failure flow for spillway discharge.

| | | |
|---|----------------|-------------------|
| PROJECT STATION 1+00 TO 1+100 SOUTHERN RAILROAD | COMP BY DTL | JOB NO. 100-15 |
| | CHK BY JCS | DATE 2-6-7 |



$$\text{Slope} = \frac{25}{400} = 0.0625$$

| ELFV | AREA | AREA |
|------|-------|---------|
| | UNDER | TO BASE |

$$Q = 1.49 \cdot A \cdot S^{0.5}$$

$$\text{DISCH.} = 1.49 \cdot A \cdot S^{0.5}$$

| | | | |
|-----|-----|-------|-------|
| 73 | 242 | — | — |
| 80 | 400 | 137.2 | 118.2 |
| 81 | 421 | 150.0 | 130.0 |
| 82 | 442 | 162.8 | 141.8 |
| 83 | 463 | 175.6 | 153.6 |
| 84 | 484 | 188.4 | 165.4 |
| 85 | 505 | 201.2 | 177.2 |
| 86 | 526 | 214.0 | 189.0 |
| 87 | 547 | 226.8 | 200.8 |
| 88 | 568 | 239.6 | 212.6 |
| 89 | 589 | 252.4 | 224.4 |
| 90 | 610 | 265.2 | 236.2 |
| 91 | 631 | 278.0 | 248.0 |
| 92 | 652 | 290.8 | 259.8 |
| 93 | 673 | 303.6 | 271.6 |
| 94 | 694 | 316.4 | 283.4 |
| 95 | 715 | 329.2 | 295.2 |
| 96 | 736 | 342.0 | 307.0 |
| 97 | 757 | 354.8 | 318.8 |
| 98 | 778 | 367.6 | 330.6 |
| 99 | 799 | 380.4 | 342.4 |
| 100 | 820 | 393.2 | 354.2 |

| | | |
|-----------------------------------|----------------|---------------------|
| PROJECT D. Failure Hydrographs | COMP BY LTC | JOB NO. 20799 15 |
| | CHK BY SC | DATE 2-6-75 |

$Q_{p2} = 5700 \text{ cfs}$
 AT OUTLET OF ORANGE POND
 $Q_{p2} @ \text{EL } 83.4$
 $V_2 = 2651 \text{ ft}^3/\text{s}$

$$Q_1 (\text{TRAIL}) = Q_{p2} \left(1 - \frac{V_1}{V_2}\right)$$

$$Q_1 (\text{TRAIL}) = 5700 \left(1 - \frac{2651}{9125}\right) = 4025 \text{ cfs}$$

$Q_{p2} (\text{TRAIL}) @ \text{EL } 82.4, V_2 = 2404 \text{ ft}^3/\text{s}$

$$Q_{p2} = 5700 \left(1 - \frac{2651 + 2404}{9125}\right) = \underline{\underline{4155 \text{ cfs}}}$$

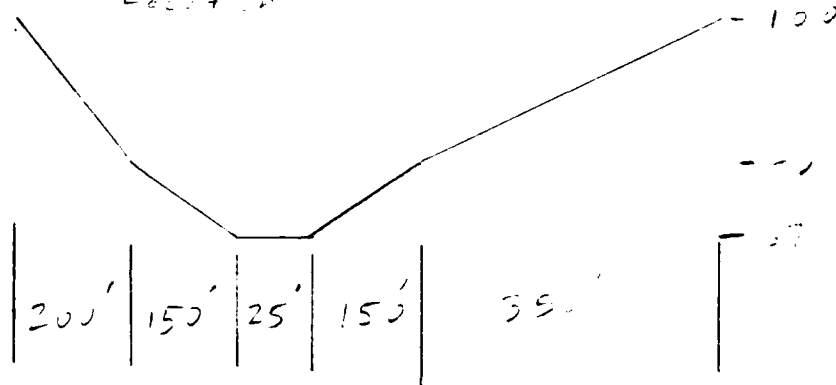
@ EL 82.4'

OR Approx. 64'
 above normal pond
 elevation.

$$\begin{aligned}
 T &= 12.1 \left(\frac{4025}{4155} \right) = 52.5 \text{ hrs} \\
 &\quad \frac{1}{2} (4155)
 \end{aligned}$$

| | | |
|---|----------------|--------------------|
| PROJECT STORAGE - DISCHARGE AT FIRST BRIDGE BELOW CRANE LAKE | COMP BY ZTB | JOB NO. 2075-15 |
| | CHK BY ED | DATE 2-6-79 |

Sum, as to $n = 0.03$
 X-Section 100 - 100 ft
 Location



Slope = 0.03

| FLFV | Area Ac STORAGE | Area Ac STORAGE |
|------|--------------------|--------------------|
|------|--------------------|--------------------|

$Q = 14 \frac{1}{2} A^{1/2} S^{1/2}$
 DISCHARGE CFS

| | | | |
|----|-----|------|------|
| 67 | 14 | 7 | |
| | 28 | 28 | |
| 70 | 41 | 62 | 180 |
| | 55 | 110 | |
| | 69 | 172 | |
| | 83 | 248 | |
| | 96 | 337 | |
| 75 | 110 | 441 | 1667 |
| | 124 | 556 | 2217 |
| | 137 | 672 | 2863 |
| | 151 | 793 | 3613 |
| | 165 | 911 | 4473 |
| 80 | 177 | 1164 | 5455 |

| | | |
|-----------------------------------|----------------|-------------------|
| PROJECT Downstream Hydrographs | COMP BY JTL | JOB NO. 2-7-75 |
| | CHK BY JTL | DATE 2-6-75 |

$$Q_p = 4155$$

AT BRIDGE 2 MILES DOWNSTREAM
OF DAM.

$$Q_p @ EL 78.6'$$

$$V_1 = 933 \text{ AC FT}$$

$$Q_p (\text{TRIAL}) = 4155 \left(1 - \frac{933}{9000}\right) = 3725 \text{ CFS}$$

$$Q_p (\text{TRIAL}) @ FL 78.1', V_2 = 854 \text{ AC FT}$$

$$Q_p = 3725 \left(1 - \frac{(933 + 854)/2}{9000}\right) = \underline{\underline{3750 \text{ CFS}}}$$

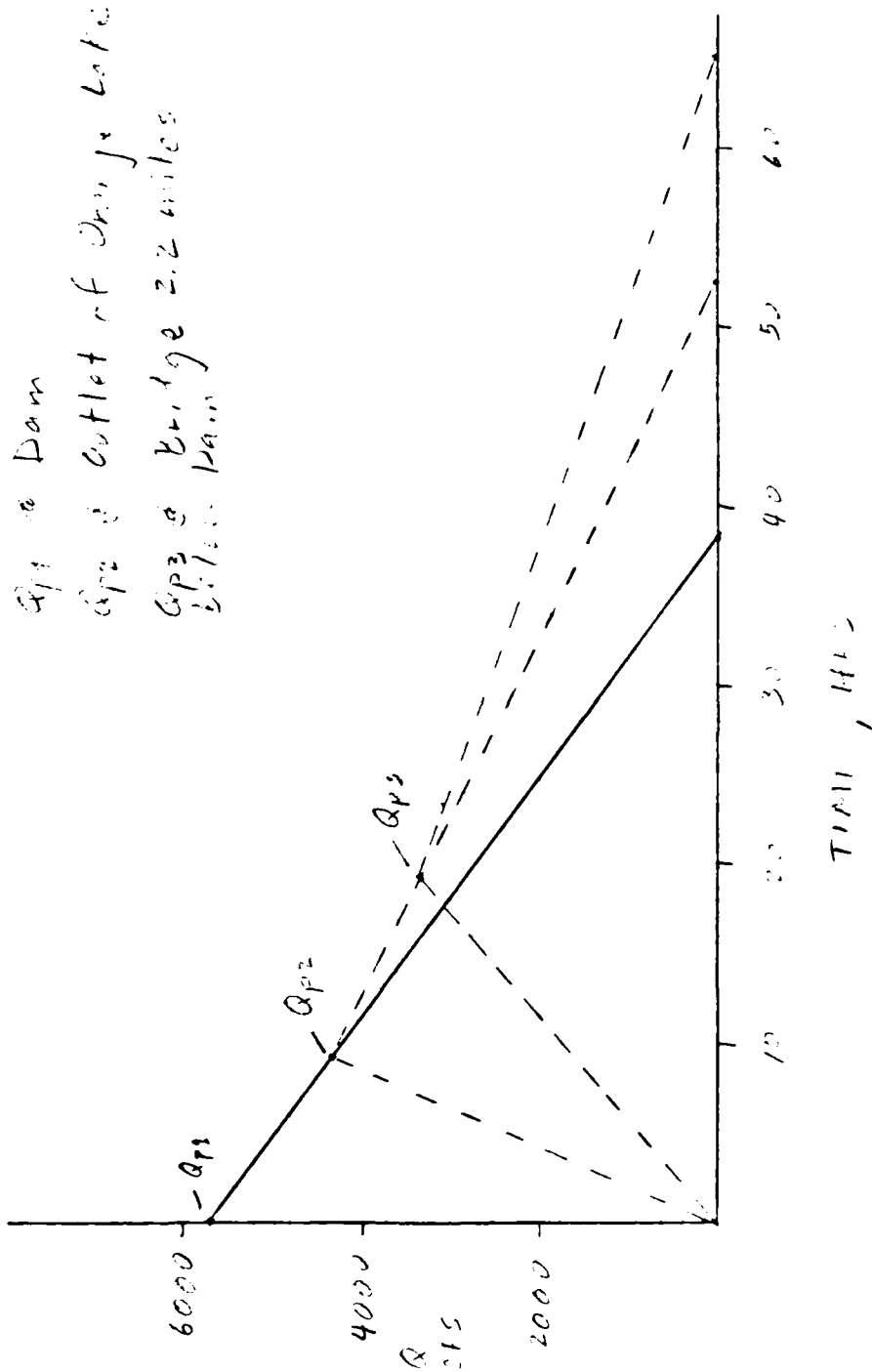
$$@ \underline{\underline{FL 77.7'}}$$

Downstream of bridge the
future hydrograph would be maintained
within the study design as shown
on the Fort St. Vrain map.

$$T = 1.01 \left(\frac{3750}{9000}\right) = \underline{\underline{65 \text{ hrs}}}$$

$$V_1 = 933 \text{ AC FT}$$

| | | |
|--|------------------|-----------------|
| PROJECT DRAINAGE AREA - 1,000 ACRES | COMP BY E. J. | JOB NO. 1000 |
| | CHK BY E. J. | DATE 1-1-71 |



D-17

Rocky Lake Dam

| | | |
|---------------------------|----------------|---------------------|
| PROJECT CLASSIFICATION | COMP BY BTL | JOB NO. 20711.15 |
| | CHK BY CD | DATE 2-6-78 |

ACCORDING TO "RCS INITIAL
GUIDELINES FOR SAFETY INSPECTION
OF DAMS":

Rocky Lake Dam is an initial initial
sized dam, Storage = 7,700 A.-Ft
Height = 14'

From Guidelines \rightarrow Storage ≥ 1000 or (5000)
or Height ≥ 40 or (100)

Hazard Potential Classification:

LOW

\therefore Recommended Spillway design flow
is 100% to $\frac{1}{2}$ PMF.

USE $\frac{1}{2}$ PMF

Route of $\frac{1}{2}$ PMF = 1450 CFS @ EL 93.0

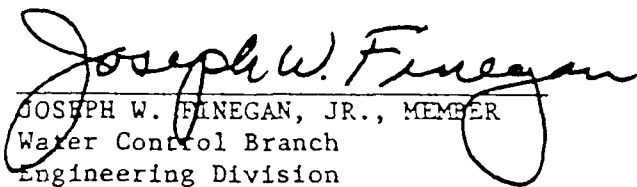
Capacity of Reservoir at Top of Dam
EL 92 = 8000 A.-Ft

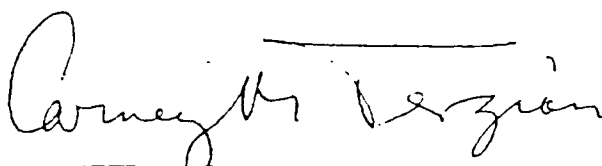
Spillway Capacity = 59% of $\frac{1}{2}$ PMF

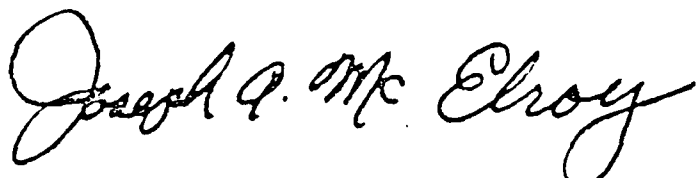
APPENDIX E

Information as Contained in the National
Inventory of Dams

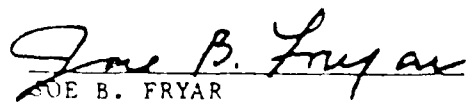
This Phase I Inspection Report on Rocky Lake Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.


JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

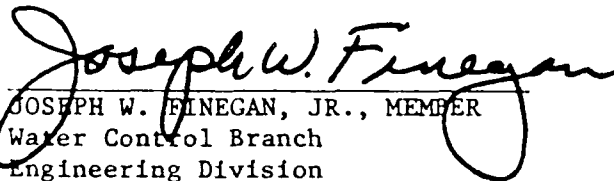

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

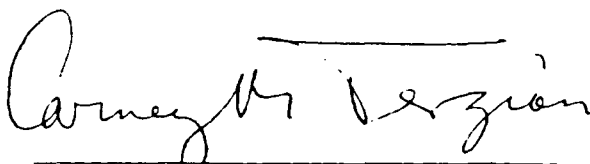

JOSEPH A. MCELROY, CHAIRMAN
Chief, NED Materials Testing Lab.
Foundations & Materials Branch
Engineering Division

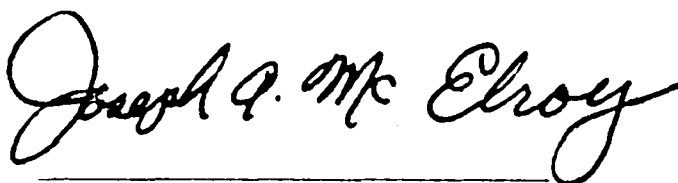
APPROVAL RECOMMENDED:


JOE B. FRYAR
Chief, Engineering Division

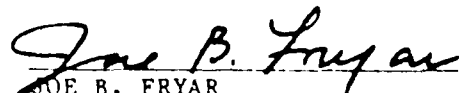
This Phase I Inspection Report on Rocky Lake Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.


JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division


CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division


JOSEPH A. MCELROY, CHAIRMAN
Chief, NED Materials Testing Lab.
Foundations & Materials Branch
Engineering Division

APPROVAL RECOMMENDED:


JOE B. FRYAR
Chief, Engineering Division

7-10-72

INVENTORY OF DAMS IN THE UNITED STATES

| DATE | IDENTITY NUMBER | DIVISION | STATE | | COUNTY | DIST | COWAN | NAME | LATITUDE (NORTH) | LONGITUDE (WEST) | RECORD DATE | |
|------|-----------------|----------|-------|------|--------|------|-------|----------------|------------------|------------------|-------------|--------|
| | | | STATE | DIST | | | | | | | DAY | MO |
| 4E | 1000 | 1000 | 10 | 00 | 00 | | | ROCKY LAKE DAM | 4446.1 | 6715.9 | 22 | ART 79 |

| POPULAR NAME | | NAME OF IMPROVEMENT | |
|--------------------------------------|--|---------------------|--|
| RIVER DILL STREAM | | ROCKY LAKE | |
| NEAREST DOWNSTREAM CITY-TOWN-VILLAGE | | POPULATION | |
| WHITING | | 279 | |

| TYPE OF DAM | YEAR COMPLETED | PURPOSES | STRAINING HEIGHT (FT) | HYDRAULIC HEIGHT (FT) | IMPOUNDING CAPACITIES | | DIST OWN | FED R | PHV/FED | SCS A | VER/DATE |
|-------------|----------------|----------|-----------------------|-----------------------|-----------------------|--------|----------|-------|---------|-------|----------|
| | | | | | MAXIMUM | NORMAL | | | | | |
| 1 | 1951 | 1 | 14 | 10 | 6510 | 4200 | 100 | N | N | N | N |

| REMARKS | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| <p>NAVIGATION LOCKS</p> <p>LENGTH WIDTH DEPTH</p> <p>100 100 100</p> | | | | | | | | | | | |

| OWNER | ENGINEERING BY | CONSTRUCTION BY |
|------------------------|----------------|-----------------|
| GRAND PRAIRIE GALLERIA | | |

| DESIGN | | CONSTRUCTION | | OPERATION | | MAINTENANCE | |
|--------|--|--------------|--|-----------|--|-------------|--|
| 1000 | | 1000 | | 1000 | | 1000 | |

| INSPECTION BY | | INSPECTION DATE | | AUTHORITY FOR INSPECTION | |
|----------------------------|--|-----------------|--|------------------------------|--|
| FORWARD C. JORDAN CO. INC. | | 24 NOV 74 | | PUBLIC LAW 92-561 AUG 6 1972 | |

| REMARKS | |
|---------|--|
| | |

WATER
RESOURCES
DIVISION

INVENTORY OF DAMS IN THE UNITED STATES

| IDENTITY NUMBER | STATE | COUNTY | DIST. | COUNTY | STATE | DIST. | NAME | LATITUDE (NORTH) | LONGITUDE (WEST) | REPORT DATE DAY | REPORT DATE MO | REPORT DATE YR |
|-----------------|-------|--------|-------|--------|-------|-------|----------------|------------------|------------------|-----------------|----------------|----------------|
| 4E 324 | NE | DAKOTA | 12 | | | | ROCKY LAKE DAM | 44° 06' 1" | 67° 15' 9" | 22 | MAR | 79 |

| POPULAR NAME | NAME OF IMPROVEMENT |
|--------------|--------------------------------------|
| ROCKY LAKE | ROCKY LAKE |
| LOCATION | NEAREST DOWNSTREAM CITY-TOWN-VILLAGE |
| 11 31 | WHITING |
| | POPULATION |
| | 1 |
| | 279 |

| TYPE OF DAM | YEAR COMPLETED | PURPOSES | STRUCTURAL DESIGN | HYDRAULIC DESIGN | IMPOUNDING CAPACITIES | DIST | OWN | FED | R | PRV | FED | SCS | A | VER | DATE |
|-------------|----------------|----------|-------------------|------------------|-----------------------|------|-----|-----|---|-----|-----|-----|---|-----|------|
| ROCKY | 14 | 10 | 6510 | 4200 | N | N | N | N | N | N | N | N | N | N | N |

| REMARKS | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <p>POWER CAPACITY INSTALLED (MW) 14</p> <p>POWER CAPACITY PROPOSED (MW) 10</p> <p>NAVIGATION LOCKS</p> | | | | | | | | | | | | | | | |

| OWNER | ENGINEERING BY | CONSTRUCTION BY |
|------------------|----------------|-----------------|
| DAKOTA POWER CO. | | |

| REGULATORY AGENCY | | |
|-------------------|--------------|-----------|
| DESIGN | CONSTRUCTION | OPERATION |
| | | |

| INSPECTION BY | INSPECTION DATE DAY | INSPECTION DATE MO | INSPECTION DATE YR | AUTHORITY FOR INSPECTION |
|------------------------------|---------------------|--------------------|--------------------|----------------------------|
| FOUL AND C. JORDAN CO., INC. | 24 | NOV | 74 | PUBLIC LAW 92-567 AUG 1972 |

| REMARKS | |
|---------|--|
| | |

U.S. ARMY
CORPS OF ENGINEERS
WASHINGTON, D.C.

INVENTORY OF DAMS IN THE UNITED STATES

| | | | | | | | | | |
|--------------------|----------|-------|--------|--------------|----------------|---------------------|---------------------|-------------|---------|
| FACILITY NUMBER | DIVISION | STATE | COUNTY | CONGR. DIST. | NAME | LATITUDE (NORTH) | LONGITUDE (WEST) | REPORT DATE | |
| | | | | | | | | DAY | MO. YR. |
| 16 | 100 | CA | SONOMA | 12 | HICKY LAKE DAM | 40° 06.1' | 121° 15.9' | 22 | MAR 79 |

| | | |
|--------------|---------------------|--|
| POPULAR NAME | NAME OF IMPROVEMENT | |
| | HICKY LAKE | |
| REGION/DASH | RIVER OR STREAM | NEAREST DOWNSTREAM CITY - TOWN - VILLAGE |
| 11 | HICKY LAKE | WHITING |
| | | POPULATION |
| | | 279 |

| | | | | | | | | | | | | | | |
|-------------|----------------|----------|------------------------|-----------------------|--------------------------------|-----------|-----|---|-----|-----|-----|---|-----|------|
| TYPE OF DAM | YEAR COMPLETED | PURPOSES | STRUCTURAL HEIGHT (FT) | HYDRAULIC HEIGHT (FT) | IMPROVING CAPACITIES (ACRE FT) | DIST. OWN | FED | R | PRV | FED | SCS | A | VER | DATE |
| | | | | | | | | | | | | | | |
| 1 | 1950 | 1 | 14 | 10 | 6510 | 4200 | N | N | N | N | N | N | N | N |

| |
|---------|
| REMARKS |
| |

| | | | | | | | | | |
|----------|---------------|-------------------------|--------------------|---------------------|----------------|-------------|------------|-------------|------------------|
| DIS. HAS | SPILLWAY TYPE | MAXIMUM DISCHARGE (CFS) | VOLUME OF DAM (CY) | POWER CAPACITY (KW) | INSTALLED (KW) | LENGTH (FT) | WIDTH (FT) | HEIGHT (FT) | NAVIGATION LOCKS |
| | | | | | | | | | |
| 1 | 150 | 1 | 5.5 | 400 | | | | | |

| | | |
|----------------------|----------------|-----------------|
| OWNER | ENGINEERING BY | CONSTRUCTION BY |
| TRANSFERRED TO CALIF | | |

| | | | |
|--------|--------------|-----------|-------------|
| DESIGN | CONSTRUCTION | OPERATION | MAINTENANCE |
| | | | |

| | | |
|---------------|-----------------|-------------------------------|
| INSPECTION BY | INSPECTION DATE | AUTHORITY FOR INSPECTION |
| | DAY MO. YR. | |
| | 25-5-74 | PUBLIC LAW 92-567 AUG 6, 1972 |

| |
|---------|
| REMARKS |
| |



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED

MAY 29 1979

Honorable Joseph E. Brennan
Governor of the State of Maine
State Capitol
Augusta, Maine 04330

Dear Governor Brennan:

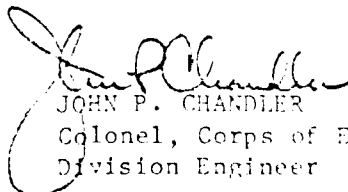
I am forwarding to you a copy of the Rocky Lake Dams Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Agriculture and the Department of Transportation, cooperating agencies for the State of Maine. In addition, a copy of the report has also been furnished the owner, M.J. Garber and Herman Galvin, c/o Mr. Warren Strout, MacDonald Page Co., 562 Congress Street, Portland, Maine 04112.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you, the Department of Agriculture and the Department of Transportation for your cooperation in carrying out this program.

Sincerely yours,


JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated



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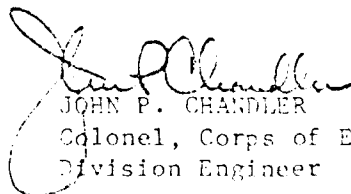
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NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED-E

M.J. Garber and Herman Galvin
c/o Mr. Warren Strout
MacDonald Page Co.
562 Congress Street
Portland, Maine 04112

Gentlemen:

Forwarded herewith for your information and use is a copy of the Inspection Report on the Rocky Lake Dams. This inspection was made under the authority of Public Law 92-367 by the firm of E.C. Jordan Co., Inc., Portland, Maine under the direction and supervision of the Corps of Engineers. A copy of the finished report has been forwarded to the Governor and the Department of Transportation and Department of Agriculture, the cooperating agencies for the State of Maine.

Section 7 of the report contains an evaluation and recommendations. If you have any questions concerning this report, we suggest that you contact the Department of Agriculture first. Then, if there are further questions contact the Project Management Branch, Engineering Division of this office. We thank you for your cooperation and assistance in carrying out this program.

Sincerely yours,

A handwritten signature in cursive script, reading "Joe B. Fryar", is positioned above the typed name and title.

JOE B. FRYAR
Chief, Engineering Division

Incl
As Stated



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

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Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

Incl
As Stated



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED-E

Mr. Martin C. Rissel, Engineer of
Maintenance and Operations
Bureau of Highways
Department of Transportation
State of Maine
Transportation Building
Augusta, Maine 04330

Dear Mr. Rissel:

Forwarded herewith for your information and use is a copy of the Inspection Report on Rocky Lake Dams. This inspection was performed in accordance with Public Law 92-367 under the direction of the Corps of Engineers. Copies of the finished report have been forwarded to the Governor, the Department of Agriculture, and the owner. We thank you for your cooperation and assistance in carrying out this program and hope this report will help you to develop an effective dam safety program.

Sincerely yours,

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JOE B. FRYAR
Chief, Engineering Division

Incl
As stated



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NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

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Chief, Engineering Division

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As stated



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NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED-E

Mr. Frank Ricker
Soil and Water Conservation Commission
Department of Agriculture
State of Maine
Augusta, Maine 04330

Dear Mr. Ricker:

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Chief, Engineering Division

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NEW ENGLAND DIVISION, CORPS OF ENGINEERS
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JOE B. FRYAR
Chief, Engineering Division

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As stated

END

FILMED

8-85

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